

Oxy Today


Number Nine, 1977



...and Yesterday

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OXY TODAY is published for employees of Occidental Petroleum Corporation. Others may receive it on request. Produced by the Department of Public Relations. Carl W. Blumay, Director of Public Relations.

BRUCE W. MCWILLIAMS, *Editor*

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Twenty years ago, Dr. Armand Hammer became president of Occidental Petroleum Corporation. In this special issue of OXY TODAY, we commemorate that event with a historical review of the companies that make up the Occidental Petroleum Corporation of today. With word and picture, we trace the stories of such companies as Island Creek Coal, Hooker Chemicals & Plastics, Best Fertilizers and more.

We also visit Libya where Occidental's international oil success started and Flotta, where Dr. Hammer recently opened the British North Sea crude oil terminal. And to complete the picture, we report on Occidental Research Corporation, where the company's technological future is being charted today.

A visit to **LIBYA** The land of Insh Allah

By Tim Halford

"Relations with the Libyan Government are at a high point as far as I am concerned—really excellent. Activity in Libya on geophysical exploratory and development work is continuing at a high level. Although one can never be sure of the future in any country in the world these days, I think we are well established in Libya and the Oxylibya organization is flexible and experienced enough to cope with the various stresses of any situation it is likely to meet. Out of a total staff of around 1,500 people, over 1,000 are Libyan nationals—an indication of how well integrated into the Libyan society this company has become."


Bob Espey, president of Oxylibya, Tripoli, 1977.

In Libya, as in much of the Islamic world, the phrase "Insh Allah" is heard often. Essentially it means "as God wills it," but in many respects it represents an attitude to life whereby misfortune can be accepted and the unexpected taken in stride. Much has happened in Libya over the years; the misfortune of war and occupation and the unexpected, like the discovery of oil. The concept of Insh Allah has carried the Libyans through it all.



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being charted today. Research Corporation, where the company's we report on Occidental to complete the picture, sea crude oil terminal. And opened the British North where Dr. Hammer recently oil success started and Flotta Occidental's international We also visit Libya where and more. Plastics, Best Fertilizers Coal, Hooker Chemicals & companies as Island Creek trace the stories of such With word and picture, we Corporation of today. the Occidental Petroleum the companies that make up with a historical review of commemorate that event issue of OXY TODAY, we Corporation. In this special Occidental Petroleum became president of Dr. Armand Hammer Twenty years ago,

A tall, silver metal drilling rig stands prominently in a desert landscape under a clear blue sky. The rig is composed of a lattice of steel beams and has several platforms and ladders. At its base, there are various pieces of equipment, including a large orange engine or generator. The ground is sandy with some sparse, dry, yellowish-brown shrubs. In the background, other industrial structures and more desert terrain are visible.

A visit to **LIBYA**

The land of Insh Allah

By Tim Halford

"Relations with the Libyan Government are at a high point as far as I am concerned—really excellent. Activity in Libya on geophysical exploratory and development work is continuing at a high level. Although one can never be sure of the future in any country in the world these days, I think we are well established in Libya and the Oxylibya organization is flexible and experienced enough to cope with the various stresses of any situation it is likely to meet. Out of a total staff of around 1,500 people, over 1,000 are Libyan nationals—an indication of how well integrated into the Libyan society this company has become."

Bob Espey, president of Oxylibya, Tripoli, 1977.

In Libya, as in much of the Islamic world, the phrase "Insh Allah" is heard often. Essentially it means "as God wills it," but in many respects it represents an attitude to life whereby misfortune can be accepted and the unexpected taken in stride. Much has happened in Libya over the years; the misfortune of war and occupation and the unexpected, like the discovery of oil. The concept of Insh Allah has carried the Libyans through it all.

On March 29, 1966, Occidental Petroleum Corporation was granted two oil concessions in the Sirte Basin area of Libya. In December, 1966, Occidental discovered oil, and during 1967, the company established that this was a major field with recoverable reserves of around 1.5 billion barrels.

In September, 1976, the Libyan government granted permission to Occidental to photograph its operations for the first time in five years. Larry Lee, a Los Angeles-based photographer, was assigned to the project, and he was accompanied by Tim Halford of Oxy's London office. Here is Tim's diary of the trip.

Tripoli, Monday...

Our first encounter with Libya is in the low drab grey customs building at Tripoli airport where officials check, search and question all arriving passengers. Larry's camera equipment attracts particular attention, and without the lengthy explanations provided by Oxylibya's knowledgeable Dr. Hassan, our trip could well have ended before it started and we would have been back on the plane to London. Once outside customs, we are greeted by the warm smell of eucalyptus...we're in north Africa.

Our drive into town is along a new divided highway that might be anywhere, but on either side the olive trees, squat brown houses and plots of arid cultivated soil tell us we're in the Mediterranean world. In the city, twentieth century development challenges the old ways; television aeriels and high-rise buildings compete with minarets on the skyline. The traffic is congested, the number of vehicles testifying to Libyan prosperity.

We are to stay at the comfortably appointed Occidental hostel which has been provided for transients like ourselves who are on their way to the desert fields or the marine terminal at Zueitina. Omar Gontrari, Oxylibya security chief who will accompany us on our travels, meets us there and, over a cup of thick north African coffee, tells us what we should and shouldn't do in Libya. His job on the trip will be to explain to local officials why these two westerners are taking photographs.

Tuesday morning...

We're up before dawn to go out to the airport to begin our assignment. As the sun comes up during our drive, we can hear the muezzin calling the faithful to prayer from the minarets, helped by 20th century amplifiers and loudspeakers. It's cold in the unheated hangar as we wait for the Fokker F27 that will take us to Concession 103 out in the desert, but at least we have some coffee to help take off the early morning chill.

Out on the tarmac, the Fokker is being loaded with food supplies, equipment and the various odds and ends necessary for the maintenance of a desert production plant. We passengers get on last and, in a few minutes, we're taking off into the sun. At first we follow the coast, overflying the cultivated coastal strip, then veer south over the mountains and there stretching from horizon to horizon, is the desert. Not flat, as I had imagined, but undulated by dunes, ridges and waddies. Here and there are signs of habitation around oases, and as we get closer to 103, we can see evidence of oil company activity—a pipeline snaking across the sands, and over on the horizon a plume of black smoke marking a field in production.

We land to transfer cargo on a dried-up lake, the ground flat and fissured like a jigsaw puzzle. Another plane, an Oxy twin otter, lands next to us and loads

vegetables, wrapped meat and other supplies for a geophysical unit working out to the west somewhere. It's mid-morning, and desert heat is rising—a marked change from the cold of the early morning.

Oxylibya's main field is at Concession 103. The production facilities are concentrated in two main areas (103A and 103D) where the oil from surrounding wells is processed.

Oil from Oxy's concessions 102 and 103 and from AGIP's Bu Attifel field converges here and is fed by a 135 mile, 40-inch pipeline to the terminal and port facilities at Zueitina on the Mediterranean coast. Current production from Concessions 103 and 102 is approximately 350,000 barrels per day of which Occidental's share is about 161,000 barrels per day.

Top, the midline pump station at Kilometer 108 on the Zueitina pipeline; bottom, stacking drill pipe on rig 38 where drilling is in progress at the Riverside site.



Top (left to right), Oxylibya's production manager Darrel Woods and Omar Gontrari, security chief. Bottom, laying pipe in Concession 29 for new production wells.



We take off from the dry lake and head in an easterly direction toward 103. The desert below is flatter now, and there is little to see but the occasional pipeline and one or two vehicles trailing plumes of sand. The flare announces 103 and, in a few minutes, we have landed. Waiting at the door of the aircraft is the local government security man who checks everyone's identity—even the old hands who have been traveling back and forth for months. All our papers are in order, and we drive over to the production area, through guarded gates, post offices, engineering areas, tanks, pipes and gas towers. It seems somehow strange to find this hive of industry in the middle of the desert.

Our next stop is lunch in the air-conditioned canteen accompanied by the constant hum of the ice cream machine. In the afternoon, we photograph the work of the plant under the watchful eye of the ever-present guard.

We're back in the canteen that evening, and after dinner, Darrel Woods, production manager for Oxylibya, tells us something of the people who work out in the desert: "There are around 180 expatriates working for Occidental in the desert, most from the United States and Britain, but there are a lot of other nationalities represented as well. The field-break system whereby the men have 33 days on the job and 21 days off is attractive to men with faraway homes, and people seem quite happy with the arrangement although you're pretty tired at the end of a shift." Woods went on to say, "It is often thought that we would get a lot of social misfits seeking jobs in the desert. On the contrary, Oxylibya's men are friendly and talkative."

Wednesday...

After breakfast, we hear that a plane is going over to 29C, a new producing area to the west of 103. Apparently radio communications with 29C have broken down and a technician is going over to make repairs, and would we like to go along for the ride. We certainly would, and in about an hour, we're coming down through the morning mist onto the landing strip at 29C.

Block 29 contains the Almas and Ali fields which are the first fields discovered under the exploration and production-sharing agreement Occidental signed with the Libyans in 1974. The fields have reserves of 20 million barrels. Though small by Libyan standards, Occidental has achieved an agreement whereby commercial development in partnership with the government is possible. These fields are now under production, with the oil being piped out under a tariff agreement with another oil company.

Once again, we're met at the plane by the local guard, in this case a very amenable character who goes along with us on our visit. A sand-battered Toyota truck takes us to the camp, crossing a road stretching off to the west on which a caravan might have straggled not too long ago.

It's hot today, a time for shimmering mirages in a landscape where the heat radiates from scorching sand and rock. The only sign of life is the camp itself; low white huts, clothes drying in the sun, a radio mast and a pipeline, with the sound and sparks of welding off in the distance. The small generators and the degassing boot hum steadily, interrupted by the resonant metallic echo of work on new storage tanks. While Larry and I photograph the various installations, the technician goes over to the radio shack. The problem was quite simple, just a faulty connection in the transmitter. It's soon repaired, and we're in the air and on our way back to 103.

After lunch we fly to Riverside, an exploration prospect where rig 38 is drilling a deep well. We're about 50 miles east of 103, and the terrain is quite different. There is no river, and the scrubby trees and sand dunes make it look like a film set for a desert adventure story.

In February, 1974, Oxylibya and the Libyan government signed an oil exploration and production sharing agreement covering blocks selected by Occidental's geologists totaling some 12 million acres. The term of the agreement is 35 years for each block on which a commercial discovery is made prior to February, 1979. Seismic work is going on at a number of locations and exploratory drilling has already started. Rig 38 is drilling one of these wells.

The track from the airstrip to the camp keeps disappearing under the drifting sand dunes, but this doesn't bother our beach buggy-like vehicle with its five-foot tires. Out here, the water table is only five feet below the surface, and this makes the area richer in both foliage and animal life than many other places in the desert. Someone points out tracks of scorpions, desert rats, desert foxes and the sand-horned piper, a local snake much like a rattlesnake. Fortunately, we don't meet one!

After getting some shots of drilling activity, Larry is captivated by the changing color and light of the desert evening, and it's almost nightfall by the time we get back to the plane and a slightly agitated pilot. They don't much like flying at night out here, and I can't say I blame them. On our way back, we can see the twinkling lights of an isolated oasis and

then the flares of the oil fields burning like ghostly cauldrons beneath us.

Thursday...

Next morning we leave 103 for the last time and fly north to Zueitina, following the pipeline. Our first stop is the mid-line pump station at Kilometer 108 where a technician is to check on the dismantling of pumps no longer needed on the line; they're being transferred to 103 for water injection work. The station is uninhabited now and, with its smashed windows and general air of dereliction, it looks uncannily like some ghost town in a western movie.

After a brief inspection, we're back in the air again, following the pipeline straight to the terminal at Zueitina. As we circle to land, we can see an AGIP tanker loading at one of the single-point moorings out at sea, and there below us are the tanks and the gas plant.

On the ground we are met by Peter Clayson and Yousef Eisa, deputy terminal superintendents.

Yousef, in charge of administration at the terminal, is one of the 430 Libyans working at the terminal. He is one of many Libyan administrative and management staff members who are gaining experience and knowledge of oil operations and are taking an increasing importance in the running of Oxylibya. There are also 115 expatriates there, mostly British, but Oxylibya is working toward more and more Libyanization of its activities. Yousef now lives in a village 20 kilometers from the terminal, but he has fond memories of his college years at the University of Wisconsin where he obtained his master's degree in business administration.

In 1967, the construction of the pipeline from 103 to the coast was started, and a terminal at Zueitina was established to process and store the oil before loading it onto tankers. Today the terminal has a crude oil storage capacity of 6.5 million barrels, and a separate gas plant has been constructed which currently provides storage for 230,000 barrels of LPG (butane and propane). This capacity is being substantially increased at the present time by the construction of storage for an additional 130,000 barrels of liquefied propane and 30,000 of liquefied butane.

The terminal has five tanker moorings—three single point moorings and two conventional offshore berths. The moorings, three miles offshore, can accommodate tankers of up to 150,000 tons.

A lot of people think that because Zueitina is on the coast it is less isolated than the desert camps; not so. While there is a village of Agedadia nearby and the coast road runs past the terminal, the nearest main town is still about 120 miles away.

White storage tanks stand out above the office and accommodation units, the tennis courts, football field and golf course—you could almost imagine this as a vacation center with the sun, the beaches and the Mediterranean sea, but there are no tourists in Zueitina. The terrain and vegetation are like the desert, although there is a date-palm lined salt lagoon on the land side of the terminal. Voracious flies are everywhere and fly-swatters are standard equipment in all the rooms.

In the afternoon, we take a boat from

the harbor pier to see repairs being made on one of the single-point moorings, and on this trip our security escort is the local captain of police. Divers are repairing a link in one of the mooring chains, but fortunately we don't see any of the sharks or barracuda that occasionally visit this stretch of coast.

Nearby, the AGIP tanker we saw from the air is completing her loading; big black hoses carry the oil over the side of the vessel. Tomorrow she'll be off to Italy with her cargo of Libyan crude oil.

We spend the night at the terminal and

wake the next morning to a sandstorm blowing in from the desert. The sand gets into everything, and it is with some difficulty that we make our way to the airstrip. Larry is worried about sand getting into his camera equipment, and both of us are red-eyed from the blowing sand as we climb into the plane that will take us back to Tripoli on the last leg of our safari.

Thursday afternoon...

We visit an Oxy family who live out in Georgimpopoli, a suburb of Tripoli favored by expatriate families, four miles outside the city along the coast. Charlie Brown, who is in charge of the Zueitina terminal, came to Libya eight-and-one-half years ago with his wife and family. One of Charlie's children was born here, so they feel quite at home.

Life for the Browns revolves around the American school where all four children attend. The school is supported by around 20 foreign companies, most of which are involved in the oil industry, and there are 800 children at the school, 40 of whom come from Oxy families. Classes are provided for pupils from kindergarten to the age of 14 or 15. About 35 per cent of the students are American. Another 35 per cent are British, with the remainder being made up of other expatriate nationalities.

Most of the sport and social activities for the expatriate community revolve around the school, and without English-language television, the children—and their parents—have to generate their own entertainment.

Although there is always a shortage of western foods, Charlie Brown's wife Sandy is sure that having to improvise has made her a better cook. The neighborhood grocery stores are well stocked and run by friendly Libyans. There are even separate meat and fish markets nearby. Sandy thinks some choices of meat she gets in Tripoli are better than she got at home, but we did meet other wives who didn't completely agree with her. With no English spoken in any of the shops, Sandy, like most of the other wives, has had to become an expert at miming. Sandy brought up an interesting point; there is virtually no crime in Libya, and women are never in danger on the streets.

Charlie Brown likes Libya: "I think it's one of the best overseas assignments. Many people think we live under difficult conditions here, but that's simply not true. I know some people have had unhappy experiences in Libya and that they've given the place a bad reputation, but we've never had any problems. The facilities for children here are excellent, and

Top to bottom: pipelaying team in the desert; pipeline work at Zueitina; Roman ruins at Leptis Magna; the baths at Leptis Magna; gas separation unit at Zueitina.



Top to bottom: sunset at Riverside, rig 38; an Italian tanker loading at Zueitina; frogmen working on a single-point tanker loading mooring offshore Zueitina.



there are good community groups for Sandy and me. In fact, we keep so busy, we probably socialize less than other expatriate families.

"The Libyan coast has probably one of the best climates in the world, and on weekends we often pile into the car and drive to one of the many beaches for a picnic or to see one of the many archaeological sites nearby. We lived in Spain for over a year, but I'm happy to be back working full-time in the Tripoli office and being home every night with the family."

Friday...

This is the day of rest in Libya, so we planned a trip out to Leptis Magna with Salem Baroudi, Oxylibya's public relations advisor; Jackie Cox, who is secretary to Oxylibya's president, Bob Espey, and Kerry Girdler, another secretary from Oxylibya. Leptis Magna is considered one of the best-preserved Roman empire cities to be found anywhere, and the streets, arches, columns and courtyards are in such good condition you can imagine it as it was when 100,000 citizens thronged this outpost of Caesar's empire.

Leptis reminds us that Libya was one of the richest provinces of the Roman empire, providing a large percentage of the grain and olives needed by the capital. With irrigation and modern farming methods, scientists believe Libya could again be one of the richest food producers in the world. In Roman times, the coastal forests of north Africa provided lions for the 'amusements' held throughout the empire, but the trees which bound the soil disappeared, probably through excessive harvesting, and the desert lands encroached to the sea.

Politically and economically, Libya lives in the 1970's, but the people of Libya have changed little over the centuries. Near Occidental's oil field at concession 103, there is a village called Augila which has been in continuous habitation for over 3,000 years, reputedly the longest recorded habitation in the world. The village, a desert oasis, is, and always has been, a watering stop for camel trains traversing the desert. Thus, Libya blends the old with the new where the old is still well adapted to the unusual Libyan environment. The Libyan people are changing in some ways, with a new sense of national pride and great advances in modern housing and transportation. But these are adapted in a special Libyan way.

As Larry and I flew out of Tripoli on our way to London, I couldn't help thinking that oil may have made many differences to the way of life in Libya, but there are attitudes there that are timeless. It is still the land of Insh Allah. ■

By John Smythe

The inauguration of the Flotta Oil Terminal by Dr. Armand Hammer, chairman and chief executive officer of Occidental Petroleum Corporation, and the Honorable Tony Benn, British Secretary of State for Energy.

Oil from the Occidental group's Piper field in the British North Sea came on stream December 7, 1976, just three years after it was discovered. It was decided that the official opening of the Occidental North Sea complex would be arranged to celebrate the loading of the first tanker at the new Flotta terminal. The date was set for January 11, 1977.

The Orkney Islands are situated some nine hundred miles north of London on the same icebound latitude as Oslo in Norway and Moscow in the Soviet Union. Flotta, one of the smallest of the Orkney

Islands, is the site of the Occidental crude oil terminal and here on this remote island, in the middle of winter, a party would be held. Occidental's chairman, Dr. Armand Hammer would be there with Tony Benn, the Secretary of State for Energy in the British government. Representatives of the companies making up the consortium would join in the festivities along with suppliers and government people. Most important, the Orcadians would attend. It would, after all, be their party and their day.

Just to complicate matters, a live television link between Flotta, the Dorchester hotel in London and Occidental's offices in London and Aberdeen was set up. It would have been impossible to fly everyone who wanted to take part in the celebration to Orkney, so a simultaneous party at the hotel was arranged. About 500 people would be there.

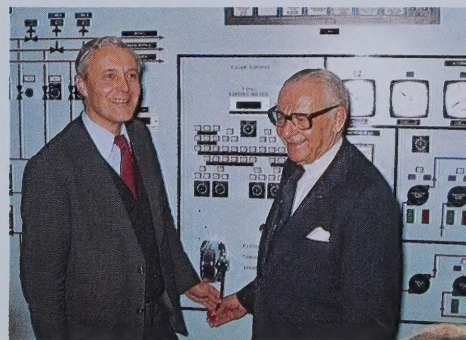
With precious little time in which to make all the arrangements for the celebration, the schedule was not being helped by the weather conditions in Orkney.

Just five days before the event, the ship that was to pick up the television equipment from Edinburgh was held up

Dr. and Mrs. Armand Hammer, the Hon. Tony Benn arrive at Kirkwall airport in Orkney aboard N10XY. They went on to Flotta aboard a special helicopter.



Benn (left) and Dr. Hammer inaugurate the Flotta Terminal. Below, Flotta with the oil terminal in the background. Flotta is one of the Orkney Islands.



at Flotta by gale-force winds, but at the last minute, the winds abated and the ship made it to Peterhead, another port in the north of Scotland. The trucks full of equipment were re-routed to Peterhead, quickly loaded on board and, in the lull, made it to Flotta on time.

In London, arrangements were made to fly several hundred guests to the main Kirkwall airport where they transferred to helicopters for the 30-minute trip to Flotta. On that day, more aircraft would land at Kirkwall than had ever landed there before in one day.

On the Sunday before the opening, the pace was quickening at Flotta. All day, a steady stream of light aircraft skated onto Flotta's icebound airstrip carrying television crews and the supplies for the party on Tuesday. Out in Scapa Flow, the tanker which loaded the first shipment of Piper field oil nudged its way toward the single-point mooring buoy.

On Monday, the weather was getting worse. Snow-laden winds were whipping across the island at speeds above 40 knots. It didn't look too promising for the next day's festivities.

Miraculously, at dawn on Tuesday, the clouds had blown away, the wind died down and the sun came up. It was going to be a beautiful if cold Orkney day.

Over on the main island at Kirkwall airport, all was in readiness to receive the fleet of chartered and private aircraft bringing the guests up from the south. A 22-seat British Airways helicopter stood by to shuttle everyone over to Flotta.

The first aircraft started to arrive about 10 a.m., and at 11 a.m. sharp, N1OXY, carrying Dr. and Mrs. Hammer and the official party, was circling the field. Twenty minutes later, they were boarding the helicopter for the short flight to Flotta, after receiving an official welcome from prominent Orcadians including Col. Robert Macrae, the Lord Lieutenant of Orkney; Jo Grimond, member of Parliament for Orkney and Shetland; Graeme Lapsley, chief executive of the Orkney Islands Council, and John Hogg, the manager of the Flotta terminal.

In London at the Dorchester Hotel, guests were arriving while television newsmen Sandy Gall on Flotta and Ivor Mills in London tested the complex television link. Everything was in order and ready to go.

On Flotta, Dr. Hammer and Benn waited for their cue in the cable-filled room next to the terminal control center while Malcolm Robertson played his new composition in honor of the event, "The Hammer of Flotta," on the bagpipes. Then, amid a blaze of flashbulbs and watched by guests attending the event on Flotta, and by those in London and in Aberdeen watching on closed-

circuit television screens, Dr. Hammer and Benn strode in and together pulled the switch to start the flow of oil from the terminal to the waiting tanker. The terminal was officially operating.

After Benn spoke, praising Oxy for the rapid development of the Piper field, Dr. Hammer thanked the people of Britain, Orkney and Flotta for their welcome and help. He said:

"I thank each one of you, for you are the ones who made this possible:

—You Orcadians who welcomed the Occidental consortium and worked so closely with us to establish an environmentally sound and socially acceptable basis for development.

—The islanders of Flotta who put up with substantial inconvenience but accepted and worked with us—and their representatives in government and the local departments who have cooperated so much on this project.

—Perhaps the greatest risk-takers of all, the managers, contractors, and members of the unions who have worked in isolated and very often difficult conditions to get this terminal ready for Piper oil.

—And, a special thanks to those Orcadians who are working with us and those who returned from other parts of the world to work for the Occidental group in Orkney, led by Captain Arthur McKay, and to all our Oxy employees who are watching and celebrating this day in their offices in London and Aberdeen."

Dr. Hammer donated £50,000 (\$87,500) to build an art gallery in Orkney, promised that the Occidental group would provide electricity and gas for Flotta, gave £25,000 (\$43,700) toward the building of a community center on Flotta and announced his intent to show The Armand Hammer Foundation art collection in Edinburgh.

What did Flottarians think about it all?

Rowland Barnett, registrar and Social Security agent: "It certainly was a great party. Without the terminal, Flotta would be a ghost island by now. In 1933, there were seventy-six children at the school. By 1972, there were only eleven. Now there are twenty-six and the school has two teachers, the island has a regularly visiting doctor, a fast boat service provided by Oxy, an airstrip built by Oxy and jobs for anyone on the island who needs one."

Leatitia Gaudie, school cook: "The inauguration was the best party Flotta has ever seen, but what a venture to undertake in the wintertime."

Yes, it was a good party, but it was more. It was an important day for Britain, and a landmark in one of Occidental's greatest ventures. ■

The tear-out insert is a replica of Occidental's annual report for 1955, issued on March 6, 1956, when Dr. and Mrs. Armand Hammer first began to finance Occidental Petroleum Corporation. Earnings for the year were \$21,099 and gross revenues were \$28,915. For the year ending December 31, 1976, approximately 20 years later, earnings had soared to \$183 million and sales to \$5.5 billion. The numbers, we think, speak for themselves.



OCCIDENTAL PETROLEUM CORPORATION

Condensed Statement of Profit and Loss

Year Ended December 31, 1955

INCOME:

Interest received—marketable securities	\$ 797.50	
Interest received—other	182.34	
Rentals received	1,000.00	
Transfer fees	172.54	
Miscellaneous income	847.73	
Profit on sale of assets	25,914.52	
Total		\$ 28,914.63
Less: Rent, salaries and other expenses		7,585.32
		\$ 21,329.31
Less: 1955 federal income taxes		230.35
Net profit for year ended December 31, 1955		<u>\$ 21,098.96</u>

OCCIDENTAL PETROLEUM CORPORATION

Statement of Deficit Year Ended December 31, 1955

Deficit at December 31, 1954		\$164,460.37
Deduct: Net profit for year ended December 31, 1955	\$ 21,098.96	
Reduction in deficit due to restatement of capital shares account—note	95,705.53	
		\$116,804.49
		\$ 47,655.88
Capital deficit per statement as of December 31, 1954	\$408,294.47	
Less: Reduction in capital deficit due to restatement of capital shares account—note	408,294.47	
		—0—
Balance December 31, 1955—per balance sheet		<u>\$ 47,655.88</u>

Note: The par value of 630,000 shares of issued capital stock was changed from \$1.00 per share to 20c per share as of December 29, 1955. The reduction of stated capital from \$630,000.00 to \$126,000.00 created a reduction surplus of \$504,000.00 which was applied to reduction of the Corporation's balance sheet deficit.

Annual Financial Report

FOR CALENDAR YEAR 1955

Occidental Petroleum
Corporation



OCCIDENTAL PETROLEUM CORPORATION

Balance Sheet at December 31, 1955

ASSETS

CURRENT ASSETS:

Cash on deposit—demand	\$28,387.90
Accrued interest receivable—interest accrued to December 31, 1955 on bonds owned by the corporation	426.25
Marketable securities—at cost	
\$15,000.00 United States Treasury bonds—2-1/2% of 3-15-58/56	\$15,478.13
\$13,000.00 Southern California Gas Company—3-1/4% of 10-1-70	13,975.00
	29,453.13
Market value of above securities at December 31, 1955 was \$28,087.19	
Total Current Assets	\$58,267.28

OTHER ASSETS

Installment note receivable—Note dated July 20, 1955 in original amount of \$20,000.00 with interest at 5-1/2% per annum. Payable in installments including interest of \$200.00 or more per month—secured by trust deed on Lot 27 in block E of Crescent Heights Tract—Los Angeles, California—Note 1	19,563.34
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FIXED ASSETS:

Oil leases—Santa Fe Springs— Oil and Gas Section valuation— 1926	\$243,350.84
Expenditures on wells—Santa Fe Springs	710,133.68
	\$953,484.52
Less: Reserves for depreciation and depletion and property written off	953,482.52
	2.00
Land owned in fee	901.72
Office furniture and fixtures— Cost	\$ 537.37
Less: Reserve for depreciation	533.76
	3.61
Total Fixed Assets	907.33
	\$78,737.95

LIABILITIES, CAPITAL AND DEFICIT

CURRENT LIABILITIES

Accounts payable	\$ 163.48
Federal income taxes payable—1955	230.35
Total Current Liabilities	\$ 393.83

CAPITAL AND DEFICIT

Capital stock authorized—5,000,000 shares— 20 cents par value—Note 2	\$1,000,000.00
Unissued	874,000.00
Issued and outstanding—630,000 shares	\$ 126,000.00
Less: Deficit—	47,655.88
	\$78,344.12

\$78,737.95

Notes to Balance Sheet

NOTE 1: Undetermined amounts will be collected within twelve months subsequent to the date of this balance sheet.

NOTE 2: As of December 29, 1955, the authorized capital stock was increased from 1,000,000 shares \$1.00 par value to 5,000,000 shares 20c par value and the Corporation was authorized to issue and sell 370,000 shares—20c par value—at 20c per share payable in cash and to grant the purchasers an option to purchase 200,000 shares of 20c par value stock at 20c per share payable in cash on or before September 2, 1956. On January 12, 1956 the Corporation issued and sold the 370,000 shares at 20c per share and the proceeds in the amount of \$74,000.00 was credited to capital shares account. The option to purchase 200,000 shares was exercised on February 15, 1956 and the proceeds in the amount of \$40,000.00 was credited to capital shares account.

TO OCCIDENTAL PETROLEUM CORPORATION:

We have examined the balance sheet of the Occidental Petroleum Corporation as of December 31, 1955 and the statement of income and deficit for the year then ended and made a general review of the accounting procedures of the company and a detailed audit of the accounts. Our examination was made in accordance with generally accepted auditing standards applicable in the circumstances and it included all procedures which we considered necessary.

In our opinion, the accompanying balance sheet and related statement of income and deficit, together with the Notes relating thereto, present fairly the position of the Occidental Petroleum Corporation at December 31, 1955 and the results of its operations for the year in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Los Angeles, California
March 6, 1956.

W. S. Wamack *W. S. Wamack*
PUBLIC ACCOUNTANTS
LOS ANGELES, CALIFORNIA

OXY YESTERDAY

As corporations go, Occidental Petroleum Corporation is not a veteran. Today, it is the twenty-sixth largest industrial corporation in America, but that status is relatively recent. In fact, the growth of Occidental really dates from the time when Dr. Armand Hammer became president twenty years ago.

Since then, a wide variety of companies have joined the Occidental family, changing the little California oil and gas company into a large and diversified worldwide corporation. These companies have contributed a great deal to the corporation, and one thing they have brought to us is their history.

Companies like Island Creek Coal Company and Hooker Chemical Corporation date back to the turn of the century, while over in Britain, Leather's Chemical Company Limited extends our corporate lineage back to the 18th century.

OXY TODAY thought it would be appropriate to the occasion of Dr. Hammer's twentieth anniversary with Occidental to trace the history of the various members of the family, not as a sterile academic exercise, but to demonstrate the wealth of background that makes Occidental what it is today.

But Occidental, above all, is a company that does not live in the past, and even the present seems only a springboard to the future.

It is fitting, therefore, that Dr. Hammer completes this historical review of Occidental with his view of where we will go in the future. If the next twenty years are anything like the last two decades, our future will be very exciting indeed.

The way it WAS

By B.B. Rios

Oxy's annual shareholders' meetings just aren't what they used to be. But you won't find Paul Hebner complaining.

Sitting in his 15th floor office overlooking Westwood Village, Hebner, Occidental's longtime director and secretary, recalls one annual meeting which took place 20 years ago. He had just joined the company whose offices were then located on Beverly Boulevard in Los Angeles.

"When the time came for the meeting, it was decided to hold it right there in the office," he says. "A notice was put in the paper, but we didn't think anybody would come, so no particular plans were made." At that time, there were probably less than 2,000 Occidental shareholders. (They now number over 300,000.)

"We were really surprised when about ten people showed up at that 1957 annual meeting." The company's second-floor offices which consisted of four small rooms were already cramped, but the furniture was rearranged post-haste to make room for the unexpected shareholders. It was a snug fit, but "it turned out all right." Adds Hebner with characteristic humor: "Luckily, we had the world's longest couch. So that's where the interested shareholders sat as we discussed the corporation's activities."

In July of that same year, Dr. Armand Hammer joined Occidental as its president. Taking over management of the company was something Dr. Hammer hadn't planned, but after investing in two wildcat wells which Occidental was drilling (they both came in successfully), he was elected president of the company.

Oxy director Arthur Groman, the senior partner in the law firm of Mitchell, Silberberg & Knupp in Los Angeles, recalls negotiating the original acquisition of Dr. Hammer's interest in Occidental: "I got a call one evening from Dr. Hammer asking me if I could meet him in the lobby of the Beverly Hilton Hotel. When I got there, he was seated in the lobby with a gentleman from Texas named Wadley. Mr. Wadley, wearing cowboy boots and a stetson,



Top (left to right): early photos of Occidental directors, Arthur Groman, Paul Hebner and the company's director of public relations, Carl Blumay. Bottom: a shareholders' meeting in 1961.

was the owner of an oil field in which Occidental was interested."

During the course of the evening, a deal was negotiated. It was agreed that Dr. Hammer would loan money to Occidental in order to finance the purchase of the Dominguez 11-well oil field located in Los Angeles. As part of that loan, Dr. Hammer was to get an option to turn his loan into stock.

"I remember that I had come without any paper or anything," adds Groman, "so I walked over to the desk clerk and borrowed a few sheets of paper. I wrote out an agreement between Dr. Hammer and Mr. Wadley. The whole transaction took place right there in the lobby."

Shortly after this meeting with Wadley, Groman received another call from Dr. Hammer. "'Come take a ride with me,' Dr. Hammer said, explaining that we were going out to 'look at our oil wells in Dominguez.'" Groman remembers stopping at a drugstore along the way because Dr. Hammer wanted to buy a polaroid camera. When Groman asked what the camera was for, Dr. Hammer responded: "I've never seen an oil field before. I want to take some pictures."

Though Oxy was 37 years old when Dr. Hammer became its president, the California-based concern was still small and struggling. The company's disting-

uishing features, besides a handful of oil wells, included four employees and a Monroe calculator that didn't work. But that would all soon change.

It is not likely that Paul Hebner and Arthur Groman will forget those early years under Dr. Hammer's leadership, or the company's tiny but cozy quarters on Beverly Boulevard, but just to remind himself that there was such a place, Hebner keeps a picture. Pulling out a faded snapshot of a small tidy-looking office, he says: "This was taken the first day I occupied this office. I was very proud. I said we'd better take a picture of it because it'll never look like that again."

And it probably didn't. Because, as he remembers, "We were working enormous hours and also attempting to get the stock books into shape. And we drilled a number of wells that first year after Dr. Hammer joined Occidental. That all made for a very busy place."

With the acquisition of Gene Reid Drilling, Inc., in early 1959, Occidental was on its way toward becoming a major discoverer and producer of oil and gas. Hebner relates how Oxy came across the talented California drilling contractor, Gene Reid: "Dr. Hammer's method was to ask everyone he met in the oil business, whose judgment he respected, who they would hire if they had their choice. He

acquired quite a list, and time and time again the name Gene Reid would appear.

"So we made a deal with Gene to drill a couple of wells. We didn't find anything but the job was handled quite well, and we found that Gene was trying to sell out his business. So we bought out his business and got him, his son, Bud Reid, a talented geologist, and a nucleus of fine people in the process."

Carl Blumay, Oxy's director of public relations, had just started working as a public relations and advertising consultant for the company when he wrote the story about Oxy's first acquisition. "It was the company's first sign of growth. After writing the story, I got pictures of Gene Reid, and took the story and pictures around to the press and saw that it was distributed around the country." In those shoestring-budget days, Blumay acted as a one-man public relations department for the growing company.

Reid, a minister's son, is remembered as a very colorful man. "A lovable, rough and ready character who had risen from the ranks, Reid had very firm opinions which he voiced without reservation," Arthur Groman recalls. He was very personable and likeable. And loyal to those around him. He was also, perhaps, one of the smartest drilling experts in the business.

With the acquisition of Gene Reid Drilling, Inc., there was a tremendous feeling of excitement because the company knew that it was going to be able to move and grow. "We knew that things were going to happen now. Gene also knew where there were people with a lot of ability, young fellows who were pigeonholed and buried in major oil companies at the time," recalls Blumay.

Reid wasted no time recruiting. He sought these men out and surrounded himself with them. These were the Teitsworths and the Vaughans and the Horaces. (All three are now officers of Occidental Exploration and Production Company. Teitsworth is also chairman and chief executive officer of Occidental Oil and Gas Corporation.)

Hebner remembers when the company took over one particular lease in 1961 near Stockton in northern California: "A major oil company had abandoned it after drilling a dry hole."

Robert Teitsworth, who had worked for that company but who was, by now, a member of Oxy's team, felt that they had not drilled deep enough. On the strength of his advice, Dr. Hammer told him to lease up that property and drill.

As a result, the company brought

in the second largest gas field in the history of California—the Lathrop field—worth \$200 million. This field is still producing today. "That really got us going," Hebner remarks. Groman agrees. "The Lathrop discovery made Occidental because it gave us the means to engage in other acquisitions and increased the value of our stock."

"During those early years, we all had a tremendous will to win—we still have it," says Blumay. "We put in extra effort and we were a bunch of mavericks, always on our toes, always ahead of everybody, always going 90 miles an hour."

For Oxy's director of public relations, "Those days were just about as exciting as any you could ever experience in business. We were a little company struggling to get ahead, and so we worked and fought hard to get there—all of us. There developed a tremendous spirit."

During those early years, Occidental was able to successfully raise money through its drilling programs. Most of the company's exploration activities were funded by investor/participants who would put up the risk capital. The company supplied the drilling rigs, the management and the skill. The marriage worked.

The difference between Occidental and most other companies in this area, explains the company's secretary, is that Occidental always retained a minimum of 50 per cent of the interest in such ventures. The deals were good. That was the policy of the company.

When Paul Hebner joined Occidental, he felt that it had good business principles, that it would be successful. Upon meeting Dr. Hammer, he was immediately impressed by him.

"I thought he would continue his pattern of success. I believed a good deal in luck, and I thought that the combination of Dr. Hammer and Occidental would be lucky...I've seen a lot of companies come and go since then," he adds. "Some that were much bigger than Occidental."

Carl Blumay remembers a discussion he had with Dr. Hammer 18 years ago, when he was asked by Oxy's president if he would like to help build a company. Shortly afterward, he went to work as an advertising and public relations consultant to Occidental Petroleum.

"They didn't have any room for me when I first came in to work, but there was an empty hallway," says Blumay with more than just a trace of laughter in his eyes. "And they had this battered old desk sitting out in the hall, so that's where I worked. Those days

were thrilling."

Blumay pictured the sort of company Dr. Hammer wanted to build. "I saw a small, healthy California oil company, because there were quite a few around at the time. They were very solid and doing extremely well. This is what I visualized Dr. Hammer was going to build. I was in for a surprise!"

The company increased its oil and gas holdings with the acquisition of Signet Oil and Gas Company in 1961 and, two years later, acquired the Best Fertilizers companies.

Paul Hebner recalls how Occidental got into the fertilizer business: "We received a phone call from a stockbroker who knew of a company that was looking for some gas. He suggested that we ought to get together with them. These folks came down for a meeting and explained that they wanted to buy gas to make fertilizer."

After the meeting, Hebner remembers Dr. Hammer asking a very astute question. "Why don't we buy the fertilizer to use the gas?" Thus, in 1963, the largest independent fertilizer companies in California and Texas were acquired. That same year, Occidental acquired Jefferson Lake Sulphur Company, the third largest producer of sulphur in the U.S.A., and its subsidiary, Jefferson Lake Petrochemicals of Canada Ltd. Groman recalls that, around the time of the acquisition, sulphur was selling for about \$12 a ton. But shortly afterward, it more than tripled in price. And what proved even more fortunate, Jefferson Lake's Canadian subsidiary turned out to be what is now Canadian Occidental Petroleum Ltd. "That company alone is worth many millions of dollars," says Groman.

The company continued to diversify and grow throughout the 60's. Some companies joining the Oxy family during that time were the Garrett Research & Engineering Company, Inc. (now Occidental Research Corporation), The Permian Corporation (domestic marketers of crude oil) in 1966, and Island Creek Coal Company and Hooker Chemical Corporation (in 1968).

Today, Occidental Petroleum Corporation is the 26th largest industrial company in America, but it still has the spirit of that little California oil and gas company that worked out of four crowded rooms back in 1957.

Are Paul Hebner, Arthur Groman and Carl Blumay surprised at the way things have turned out? Not in the least. While the results have exceeded their original expectations, they all felt when they joined the Occidental team that it was entirely possible. They expected to be challenged. But they also expected to win. ■

The making of a GIANT

The history of ISLAND CREEK COAL COMPANY

By Mike Musulin II

Two young gentlemen, recently graduated from Harvard, were tramping through the West Virginia mountains. In an isolated valley, there was a stream known by the locals as Island Creek and in this year, 1901, the locals included a family named the Hatfields who had been involved in some energetic discussions with a family over in Kentucky known as the McCoy's.

Our two young gentlemen were in this particular valley to look at a promising coal outcrop they had heard about, and after a dusty but successful day, they retired to their tent, and as would be expected of gentlemen, they changed into dinner clothes before sitting down to their evening meal. It would be interesting to know what a passing Hatfield or McCoy might have made of this display of elegance amidst the rugged West Virginia hills.

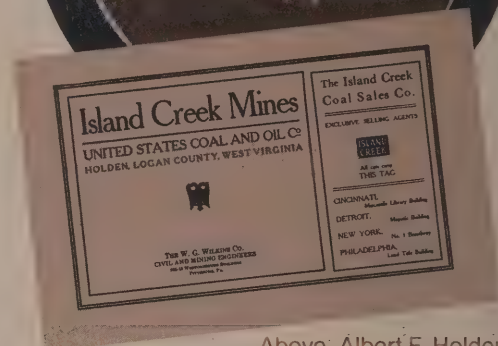
We do know the result of the day's activity, however. Within a year, a new firm, Island Creek Coal Company, was in operation, and one of the young men, Albert F. Holden, was the first president of this company that was to grow into one of the largest coal producers in the United States, and in time, an important member of the Occidental Petroleum Corporation family.

Curiously, Island Creek started as part of a petroleum company, too. Back in 1895, the United States Oil Company was formed. It was for this company that young Albert Holden traveled into West Virginia to look at some coal property. In 1902, the board of United States Oil Company authorized the purchase of about 30,000 acres of bituminous coal lands in Logan and Mingo Counties and changed its name to the United States Coal & Oil Company.

That same year (1902) found Albert Holden back in Logan County with the job of setting up a coal mine in an area that had no roads, no rail access and a sparse local, scattered population of about 100. (The battle of the Hatfields and the McCoy's apparently had a negative effect on the area's population growth!)

To bring in the huge quantities of material and machinery needed for the mining operations and the construction of a town, the new company shipped freight on the Norfolk and Western railroad to Dingess, West Virginia. It was then transferred to wagons pulled by oxen or mules, with the wagon trains traversing 12 miles of mountainous wilderness to get to the mine site. Some of the material was also sent on the Chesapeake and Ohio railroad to the last point on the line, the tiny community of Midkiff, West Virginia, and then trans-shipped onto push boats for the journey up the Guyandotte River to Logan, where wagon trains picked up the cargo for the last leg of the journey.

The first order of business was to erect a band mill to cut the lumber needed for coal tipples, the mine buildings and houses. Holden and his colleagues had decided that, in order to attract miners to this remote area, they would build a model mining town, and, in record time, they did. Comfortable houses, tree-lined streets, a clubhouse, the company store, schools, were all built from local materials; in fact, in the first year of construction, more than



Above, Albert F. Holden, Island Creek Coal Company's first president. Below, Island Creek miners in 1925.

2,500,000 feet of lumber came out of the sawmill, while a brick-making plant looked after the more substantial construction needs. By 1906, the town of Holden, named after Albert Holden, was operating and, by 1907, Holden could report a profit to his board.

Getting miners for the new mine was a serious problem for Holden. The local mountain people didn't take too kindly to the idea of working underground, so Island Creek's management came up with the idea of recruiting virtually at source. Representatives were sent to Ellis Island where they convinced sufficient numbers of immigrants that West Virginia would be where they really wanted to settle in America. Present-day residents of the Holden area with names like Sorrent, Paluso, Dardi and De Pietro stand as a reminder of this somewhat novel recruiting scheme.

The railroad came to Holden in 1904. The company built its own 12-mile line to Logan where it connected with a new spur put into Logan by the C & O. Proudly named the Island Creek railroad, the 12-mile line moved 147,000 tons



of coal from the new mine in 1905, while, only four years later, more than a million tons of coal a year were coming from the Island Creek mines.

In that year, 1909, the company had six producing mines and two others under development. The company had constructed nearly 400 buildings at Holden including houses, barns, power plants, machine shops and stores. Other amenities such as roads, bridges, lighting, drainage and telephone systems had also been installed. Holden was well on

insistent demand for coal throughout the world." By the next year, all mines were operating at full capacity to produce over three million tons and a profit of about \$3 million.

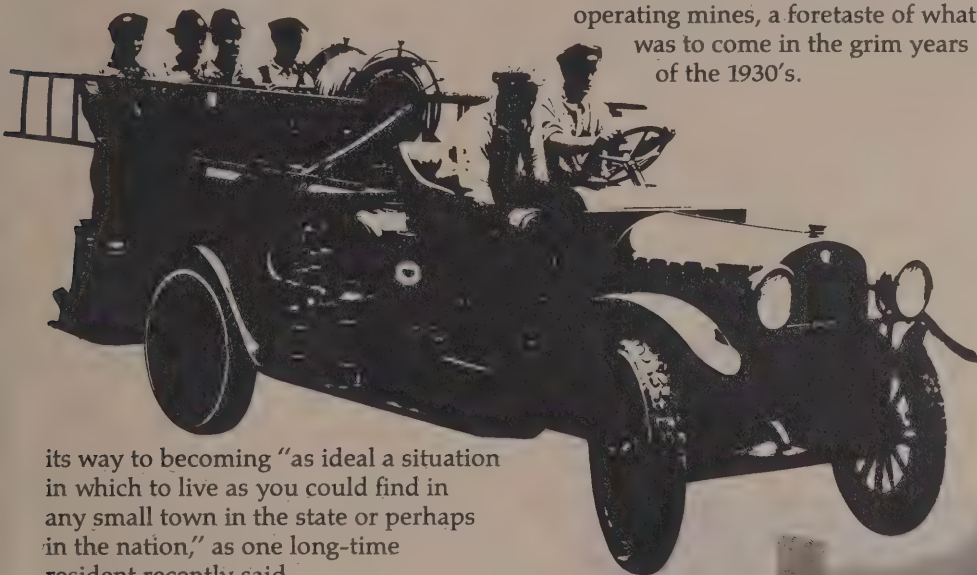
Island Creek continued to open new mines throughout the 1920's, and facilities for handling and storing coal were constructed at Cincinnati, Ohio, and Huntington, West Virginia. By 1929, however, demand was beginning to slacken and prices fell to their lowest level since 1916. Island Creek had to begin closing some of its twenty operating mines, a foretaste of what was to come in the grim years of the 1930's.

The depression hit the coal industry hard. By 1932, Island Creek had closed all but five mines, and production was down to 3.4 million tons a year. It was a difficult and trying time for the company, as it was for the entire nation. Moreover, the 1930's were a time of great and fundamental change for the coal industry. There were the economic problems of the depression to be faced, but, at the same time, government was taking a stronger hand in the affairs of the industry through the National Recovery Act, the Bituminous Code and the Guffey Act. Moreover, the miners were organized by the United Mineworkers of America Union during the decade, and organization came to Island Creek in 1933.

It was in the 30's that Island Creek virtually revolutionized its mining and processing techniques. A \$2 million program was initiated to "make changes in methods of production, screening, cleaning, handling and mixing the various sizes of coal as well as increasing the number of sizes made."

The days of the pick and shovel were over. Mechanical cutting machines, drills and loading machines replaced the solitary man with his hand tools. Above ground, sophisticated cleaning and sizing equipment was installed in the preparation plants. The president of Island Creek during this time of change was James D. Francis, one of the founders of the company and a man who was to be a strong influence, not only on the company, but on the whole industry as well. At a time when sales of coal were dropping off, he helped to create and then lead the Appalachian Coals Company which acted as selling agent for 127 different coal operators, including Island Creek.

Entering the period of the 1940's, Island Creek faced a severe manpower shortage. More and more men were enlisted in the armed services. Fewer men were available to mine coal, but the nation demanded more and more



its way to becoming "as ideal a situation in which to live as you could find in any small town in the state or perhaps in the nation," as one long-time resident recently said.

Island Creek Coal Company was formally organized in 1910 and, in 1915, took over the actual ownership and management of the U.S. Coal and Oil Company properties. The old company was no more.

The remainder of the decade through 1920 was rough sledding for Island Creek. From a production peak of 2.2 million tons in 1916, production began to drop steadily due to a shortage of men and railroad cars during the war years as well as government controls on wage scales, distribution policies and selling prices.

By the end of 1920, however, the company's annual report noted "an



Above, the Holden volunteer fire engine and crew in 1925, and a view of the Island Creek Coal Company Mine No. 21 in Holden, West Virginia.



coal to fuel the wartime industries and make up for the lack of imported fuels.

During the Second World War, from 1941 to 1945, Island Creek responded to the cause. The company produced more than 41 million tons in that five-year period and fulfilled a promise that President Francis made to the stockholders in the 1941 annual report:

"Your organization feels that the greatest contribution it can make toward winning the war," he wrote, "is to furnish coal as needed in ample quantities, and to this end, your company and your employees are devoting their best efforts."

To help this effort, the company organized Marianna Smokeless Coal Company in 1941. Operating in nearby McDowell County, West Virginia, this organization became a part of the Pond Creek Pocahontas Company that Island Creek managed.

Island Creek also acquired United Thacker Coal Company, located adjacent to its present properties in Mingo County, adding more than 100 million tons of recoverable coal to its reserves.

From 1944 to 1949, capital expenditures for new plants, machinery, equipment, floating equipment, docks on rivers and lakes, retail yards and stores amounted to \$13.5 million. And no new financing was arranged to pay

for these improvements. The money came from savings out of earnings, reserve funds to offset depreciation and depletion, and profits from the sale of coal.

In the period from 1910 to 1948, Island Creek had expanded from the ownership or lease of 28,200 acres of coal land to nearly 88,000 acres under ownership or lease. This expansion would continue through the next two decades as Island Creek continued to grow and add important new reserves and properties that would shape the destiny of the company in the coal-rich 1970's.



Above, the Island Creek Coal Company store at Holden; below, a bird's-eye view of Holden; inspector L.T. Dodd sitting atop a piece of coal weighing 3,000 pounds.



In 1949, Ray Salvati succeeded James Francis as president of Island Creek. Francis continued his association with the company as chairman of the board until 1952.

In 1951, a young man who was born near Holden and received his mining engineering degree at Virginia Polytechnic Institute, joined Island Creek Coal Company. During the next twenty years, this man would hold virtually every operating management position within the company, starting as a section foreman. Stonie Barker, Jr., now president and chief executive officer of Island Creek, worked his way up through the company gaining valuable experience before reaching the top spot.

Looking back a quarter of a century, Barker remembers that, for him, there was never any doubt about his future. "I considered Island Creek to be one of the most progressive companies in the industry at that time," he recalls. "I had worked for Island Creek for a couple of summers prior to my graduation from Virginia Polytechnic Institute, and I had gone through quite an appraisal of my future before graduation. When I took a job with Island Creek, I expected to remain in the industry all my life, and to stay and make a career with Island Creek."

"I have never once lost faith or confidence in the coal industry, even in the dark days of the 50's when we were working only three or four days a week," Barker said. "This country has known for 20 or 25 years that the domestic reserves of oil and natural gas have been limited. Anyone with foresight could clearly see that coal had to replace many of the requirements then being met by the oil-and-gas industry. It's been inevitable for years that coal is part of the answer to our energy problems."

The 1950's was a time of innovation. "Back in the 50's," recalls W. F. Diamond, vice president of engineering, "roof bolting was, at best, a makeshift operation. The holes were drilled in the roof by using a jackhammer-like machine that weighed about 125 pounds. This machine (known as a stopper) had to be moved around by hand. Of course, that's brute-type work."

"This roof-bolting procedure was one of the bottlenecks we found in the mining cycle. Also, we wanted to take some of the heavy work out of this roof-bolting job. We wanted to make it easier for the man to use the machine and to move it about. So we took it upon ourselves to design a machine that would move the stopper from place to place. First we made some sketches, and then we designed the machine. We

started with the chassis of a different machine and then built the structure for the bolting machine on top of it. We only built one prototype machine, but a lot of equipment manufacturers came to look at it."

"After we put the machine into use," recalls C. W. Rountree, director of industrial engineering, "the industrial engineering department ran studies on the mining cycle time to determine the improvement. The results were tremendous, and not too long after that an equipment manufacturer came out with the 'Jumbolter.' That machine was the forerunner of today's modern bolting machines, and it all started in the Island Creek shop because we wanted to find a better way of doing things."

The 1950's also saw many important acquisitions. The most notable was the purchase of the physical plant, equipment and coal leases of the Red Jacket Coal Corporation owned by the W. M. Ritter Company. Part of the reserves purchased in that package was a large tract of coal in Buchanan County, Virginia, which is now being mined by the company's Virginia Pocahontas Division. This coal, known as the Pocahontas Number 3 seam, is one of the highest quality low-volatile coking coals in the world.

Other acquisitions during this period were the sales division of the Cleveland Cliffs Iron Company, the Algoma Coal and Coke Company, the Guyan Eagle Coal Company and the Elk Creek Coal Company.

Each new purchase added important reserves to the company's total, and it assured Island Creek's customers of their choice of many different types of coal. As President Salvati explained in the 1957 annual report, "Our policy is not to grow merely for the sake of growth, but only when we can increase the value of our services to our customers and improve stockholder equity and earnings."

Also during this period, the Pond Creek Pocahontas Company, which had operated under Island Creek's management since 1923, was formally merged with the parent company. "The Pond Creek mines turned out to be some of the most profitable mines that the company has had," Barker recalls, "because, at that time, those reserves were considered to be the most premium low-volatile metallurgical coals in the country."

The market for metallurgical coal was favorable, but Island Creek decided to enter the utility coal market as well. To accomplish this, the company acquired the West Kentucky Coal Company and its 800 million ton reserve of steam coal. Today, its steam coal

reserves now total in excess of one-and-one-half billion tons. "Prior to this time," according to Barker, "we had concentrated on serving the metallurgical and industrial steam market, both of which require high-quality premium coals."

"With the acquisition of West Kentucky Coal Company, Island Creek could participate in the growth of the utility coal market. Projections indicated that growth in the coal industry would be in this direction. Island Creek had not participated in this market to any great extent, and the addition of these reserves were calculated to place our company in a favorable position in the growth of this market."

Shortly after this acquisition, Island Creek and West Kentucky Coal Company were merged into one company known as Island Creek Coal Company. The new company was incorporated on December 31, 1964, in the State of Delaware.

James L. Hamilton, formerly executive vice president of Island Creek, became its president in 1961, and Raymond Salvati was elevated to chairman of the board. Hamilton served as president until January, 1965, when he replaced Salvati as chairman, and William Bellano, formerly head of a large Texas sulphur company, became Island Creek's sixth president.

The acquisitions of this period assured the steady growth of the company, but they also created a fundamental change. Island Creek had continually expanded in the early years using Holden as the operational headquarters. With the new acquisitions, the division concept was born.

"With the acquisition of West Kentucky Coal Company," Barker recalls, "we had the beginning of the division concept in our company. We operated with the Island Creek Division and the West Kentucky Division until we acquired the Evans Elkhorn and Inland Steel properties in Eastern Kentucky. We then set up the Evans Elkhorn Division. These mines were later incorporated into the Island Creek Division. This formation was used until the mines in Virginia began to be developed. We realized then that the deep mines in Virginia had a unique identity of their own, and we formed the Virginia Pocahontas Division."

During this time, Island Creek also acquired 100 million tons of steam coal reserves in Martin County, Kentucky, now in operation as the Pevler Mine, ranked as the 34th largest coal operation in the country in 1975. According to Barker, current events have made that acquisition a very good move.

"In the late 60's, when we acquired

the Pevler reserves, they were uneconomical to mine and were referred to as low-BTU quality coals. Those reserves only came into being in the early 70's, and they turned out to be one of the few low-sulphur compliance coals in the Appalachian area. They are in great demand today by the utility companies in this country."

On January 29, 1968, Occidental Petroleum Corporation formally acquired Island Creek Coal Company. Nine years later, Barker says that the relationship has been a good one and one that has shown benefits on each side.

"The acquisition of Island Creek by Occidental has had one great benefit in that it has allowed Island Creek to expand in the Virginia area and in other areas where we are now operating. Oxy has provided the large sums of capital money for this expansion. In fact, Island Creek would have had difficulty providing the money for expansion on its own, and probably would have been precluded from doing many of the things we are doing today. Without the capital money supplied by Oxy, Island Creek could not have built new mines and we would not be enjoying our present position in the coal industry. On the other side of the coin, I believe that Oxy has been very pleased with the results of Island Creek," Barker said. That makes for a good relationship. Oxy is pleased, and Island Creek is also pleased and has benefited by being a subsidiary of Occidental Petroleum.

A year and a half after the merger with Oxy, the Maust Coal and Coke Corp. was acquired with operating properties in central West Virginia. "We were looking to not only maintain our position of leadership in the metallurgical market, but also to participate in the growth of the utility market as well," Barker stated.

In 1972, former U.S. Senator Albert Gore joined Island Creek as chairman of the board.

Today, Oxy's Island Creek Coal Division consists of four operating divisions, a retail stores division, and the Island Creek Coal Sales Company. The corporate office and the sales company were relocated to Lexington, Kentucky, in 1973. The operating divisions are the Island Creek Division, located in eastern Kentucky and southern West Virginia; the Northern Division, located in central West Virginia and southwestern Pennsylvania; the Virginia Pocahontas Division, located in southwestern Virginia; and the West Kentucky Division, located in western Kentucky. The retail stores division is headquartered in Holden, West Virginia, where it all began over seventy years ago. ■ 13

From a MOUNTAIN comes a dream

By Marney Talbert

Travelers going west through the Grand Valley of Colorado can see the far-stretching miles of the Roan Cliffs, little realizing that in these and the adjoining Rocky Mountains lies the greatest oil reservoir in the United States. Millions of years ago the seas became lakes, the lake floors became mountains and the fossil remains became a waxy substance mixed with sand and clay. This mixture became a petroleum substance known today as kerogen, or shale oil, and it was locked in the Rocky Mountains.

Driving through the shale country on my way home from Oxy's Logan Wash operation in my "4-wheel drive covered wagon" has increased my knowledge and strengthened my interest in western Colorado, oil shale and the environment, but these "road miles" will never equal the miles my mind has wandered into the history of this country. Let me take you back to those pioneer days.

The year is 1868. We are tired, dusty and hungry. We have tramped across dreary desert wastes, averaging only ten miles a day, so it is with heavy hearts that we view this wild and desolate area surrounding us. After fording the Grand we make camp for the night.

During the evening, my father and I receive a visit from three Indians who inform us that we are in Ute territory.

The braves tell my father that we are three sleeps away from the house of Chief Ouray and that the gods of the mesas will protect us under the name of Ouray. They advise us to turn more in a northeasterly direction and go where the river is completely surrounded by mesas on all sides. There, the braves tell us, the mesas with the flattops will hold the snows of winter and keep the air cooler in the valley.

The Ute Indians become our friends and teach us much about this new land of ours.

Perhaps one gainful lesson was learned on a stormy night when bolts of lightning were dancing across the clouded sky. A young Ute girl and her brother explain how the land can "talk" to you when a yellow bolt of lightning crashed into the side of Mount Logan, sending up shoots of fire and flame

from the rocks. They tell me that this mountain holds the "rocks that burn."

These first few years we have devoted mainly to establishing our home. We've learned to use these bluish-gray rocks to ignite our fires for warmth and cooking, and we have learned that the residue from these rocks serves as an excellent harness oil and grease for our wagons. Gardens and fields have been planted, and we learn that this oily substance from "the rock that burns" can serve as a fertilizer and weed killer in our orchards.

This year, 1882, more and more settlers are coming into our area. The town of Parachutte has been established, and the menfolk are busy building our first road, bridges, and cutting our first mountain trails. Prospectors are venturing into our valley and with them come stories of mining booms in various other Colorado locations.



Old stage station near DeBeque, Colorado.

I overhear that there are approximately 32,000 mining claims staked in the state of Colorado. The Colorado Mining Association and the Colorado School of Mines have both been formed.

My father says there is no gold in our valley. Instead, my father tells me about a "liquid gold" that we might get out of our rock. We both recall how the Utes used the dark, waxy residue from our shale rock for medical purposes. Some of our neighboring ranchers are using this oily, waxy substance for healing open wounds, and my father thinks that maybe there is a medical use for this "gold" within our mountain.

We laugh, remembering another rancher friend who built a beautiful rock fireplace for his new home out of these same gray rocks and invited all of us to his housewarming. Unfortunately, soon after Mr. Callahan lit his large new fireplace, it quickly began to melt, causing the house to catch fire and promptly burn to the ground!

During the next few years, Garfield and Rio Blanco Counties are organized and we begin work on our first school! The Rock School, named quite appropriately for our "rock that burns," was

erected on Piceance Creek in 1896.

In 1900, "oil shale," as it is now being referred to, begins to be mined in areas either close to the surface or visually exposed along the sides of the mountains, and I learn there are approximately 200 separate mines operating in Colorado alone, all working to establish the first workable retort to heat and collect the oil from our rock.

Grand Valley (formerly Parachutte) and Rifle have become established towns. Rifle is the cattleman's town while Grand Valley develops as a fruit-growing center. DeBeque has been incorporated as a town and is a very important supply point. A daily stage line is operated from DeBeque southward toward Colbran, and a tri-weekly line is established northward along Roan Creek.

With the establishment of the stagecoach and the stage station along the river, we are able to have equipment, supplies and tools delivered within six to eight months time which greatly speeds us on toward our goal.

At times the heavy snows and rugged terrain make us discouraged. Sometimes our men are living in tents, doing their own cooking, and working seven days a week for approximately \$3 a day. All of the drilling for blasting is done by hand as we have no roads and, it is next to impossible to bring our wagons into the working site.

One man whom I admire highly is Dean Winchester who works for the United States Geologic Survey group that has come to survey the oil shale lands. In his report, Mr. Winchester calculates approximately 40 billion barrels of oil locked inside our beautiful western Colorado mountains!



An early oil shale retort.

Shortly after Mr. Winchester's report to Congress, the government stepped in and laid out guidelines for claiming and maintaining staked or patented claims. The Department of the Interior set aside the first Naval Oil Shale Reserve which leads to a big boost in interest in oil shale. The interest of the nation in our western home is riding on a high steppin' horse, and the time is ripe!

In 1917, just a few miles northeast of DeBeque, Colorado, we witness the erection of Colorado's first aboveground retort. The entrance to our own small but operable mine is visible along the south face of Mount Logan.

With our dream nearing a reality, our efforts increase. We had set out to prove something to our neighboring ranchers and have gotten ourselves caught up in the whirlwind of proving something to the nation! More inspections, more surveys, more people arriving—all seeking answers and bringing change to the mountains.

In 1920, Congress passes the Mineral Leasing Act in an effort to halt further alienation of public lands in our Piceance Creek Basin. Although I realize that the government is trying to protect our western world, this Act is also slowing our progress and the progress of so many of our friends who have since joined us in similar ventures of their own.

We continue our labors, but many of the claims and workings surrounding us on the nearby hillsides are being abandoned. Money is short, but we keep going. We have proven that we can get oil from our "rock that burns" but our process is expensive both in terms of money and physical effort.

Now that the depression is with us, the lack of an economical process has become the biggest barrier to further oil shale development. We are forced to close Piceance Star Mine, at least for a while, until we and the country have had a chance to recover from the depression.

Although we have produced only a small amount of oil, we have proven a dream. Perhaps, in time, what seem to be insurmountable problems will be overcome, and someone will take our dream into the realm of reality.

I'm nearly to the Guard Gate now. The mine and the retorts of Occidental Oil Shale, Inc., are all behind me.

There's a deer on the side of the road up ahead of me, and I wonder, too, if his ancestors witnessed the labors of my ancestors nearly 100 years ago here in this same Piceance Creek Basin.

As the sun sinks deeper behind the rim of the mountains, I wonder if my ancestors can see what Occidental is

doing with its dream and its mountain just a couple of miles from the entrance of my ancestors' first mine!

Occidental has improved on the methods of mining the rock and has developed its own retort or oven inside the mountain. Gone are the days when the mined rock had to be loaded onto the backs of mules or donkeys and brought down a narrow game trail to a distant retorting site. Gone, too, is the need for man to load the rock into the retort or search for canyons in which he can dispose of the used shale rock after obtaining the oil.

It was only 100 years ago that the first white settlers came to this country and less than 75 years ago that they first used oil shale; it really isn't so very long ago. Occidental's in-situ recovery process was only a field test four years ago, and now that dream is becoming a reality.



An early oil shale mine.

Through the gate, turn left and follow the Roan Creek Road into DeBeque and on toward home. Winding through the canyon on a paved four-lane highway, the historical remains of the stage station that carried in the tools and supplies during the late 1880's, before the era of the railroad, are over to my right, and I can't help but reflect back on an extract from a letter written in 1918 by George O. Smith, then director of the U.S. Geological Survey Group:

"The day that some company undertaking the production of oil through the distillation of oil shales in this country proves, through actual practice, that oil may be produced successfully and continuously on a commercial scale at its plant, then a new page will have been turned in the industrial history of these United States."

I don't think Mr. Smith is wrong, and I wonder if we shouldn't reflect back on our past history, and what our forefathers have to tell us more often. ■

Shades of the OLD BEST

By B. Dan Williams

The Young Stanford grad turned to fertilizer selling during the Great Depression. He soon formed a dream...his own fertilizer company. 1932 was a tough year for dreamers. But, Lowell Berry had the pioneering spirit and a loan of \$2,600 to find the need, and fill it.

The sign went up on the ramshackle brick building in Emeryville, California. "The Best Fertilizer Co." How could he lose with a name like that?

The dream took root. Berry began touring the rice country of Northern California. Promising farmers direct shipments of good fertilizer mixes, he quickly secured the potash, ammonium sulfate, superphosphate and a mountain of sand needed to mix the first "Best" products. Basic equipment? An old cement mixer and all the truckers he could corral.

It wasn't until World War II that the company really began to gain ground. With large allocations of raw materials, and solid government contracts, Best moved to nearby Oakland. The business grew ten times over.

Still mixing fertilizers after the War, Best took on Army contracts to ship massive quantities of non-explosive ammonium sulfate overseas. Only one problem...they had no plant. With great ingenuity, and old junk parts, three ammonium sulfate plants were built in 80 days at Oakland, California; Baltimore, Maryland; and Houston, Texas.

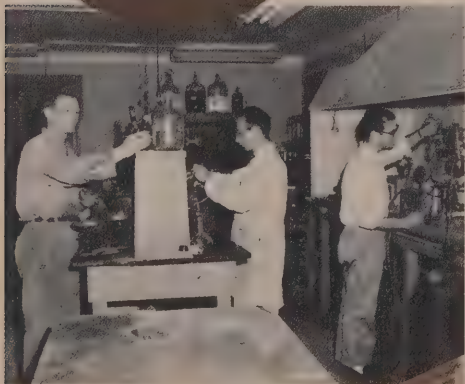
As demand for ammonium sulfate continued, Best expanded. Financial interests were developed in several



Packaging fertilizer at Best plant.

California farm dealerships. More salesmen were added. They were a rugged bunch. Had to be. Most of them were heavin' 80 pound sacks on board trucks and making their own deliveries. Jack Horner was hired as sales manager in 1950, and later pioneered Best's proprietary position in the agricultural nematocide business, which he still manages today. Best expanded into Arizona. Oakland shipped fertilizers to Arizona cotton farmers and dealers. Best Fertilizers of Arizona, Inc. was formed with headquarters at Casa Grande, Arizona. Two of the original group, Charles Laimore and Art Lofgreen, are still running the Arizona operation today in four locations. The Houston-based Best plant also continues in operation with several of the original employees.

During the war, Best developed a pilot plant in Oakland to produce a revolutionary new kind of fertilizer: an homogenous blend of nitrogen, phosphate, and potash in pellet form. The idea became a reality in May of 1950 and put "Best" squarely on the map.



With heady determination, Best elected to move to a new plantsite in Lathrop, California, close to the inland seaport of Stockton in the center of wide-spread agricultural activity. Oakland was retained to handle the lawn and garden business, while the Baltimore plant was closed.

The theme, "You Get Results With Best" was developed. Huge fifty-foot dark green letters appeared in the pale grass of the Altamont Pass, spelling B-E-S-T for highway travellers between San Francisco and the San Joaquin Valley. Cattle, seeking a good meal, would often abandon the surrounding range and crowd onto the thick, lush letters. People like Ken Nelson, (currently the Northern Region Sales Manager) and Weir Fetter, (recently retired) spent many hours fertilizing the hills to speak for themselves, while sales quadrupled on products like "Berry's Best."

In 1956 Lowell Berry was enroute to Texas for a National Fertilizer conference, and met Dr. Bill Garman. Garman, previously a professor of soil science at Cornell, was then agricultural service manager for John Deere in Texas. Garman was hired as Vice President-Sales, for Best. Bill Garman built a strong sales group instructed to demonstrate the superiority of homogeneous pellets. He energetically organized a farmer-industry partnership in the Best ammonia plant and formed California Ammonia Co. (CALAMCO). This venture, with 1,600 farmer-stockholders, has provided a handsome return on investment during the last 20 years, for farmer and company alike. At the time, Best's total sales were about \$5 million.

About the time CALAMCO was created, Jack Horner demonstrated a tremendous need for nematocides to help rid California soils of the harmful

microscopic organism called nematodes. He developed the idea of impregnating the homogeneous fertilizer pellets with an upcoming new nematocide in strengths sufficient to do both a fertilizing and fumigating job. This marked Best's entrance into the agricultural chemical pesticide field. A few years later, Best Nematocide was manufactured and sold independently of fertilizers. The market was far greater than expected! Best eventually added other forms of pest and weed controls to their fertilizers, the forerunners of today's complete agrichemical line of 600 products under the OXY label.

Berry also hired John M. "Red" Harris as president. Then he had another idea. A relatively new company known as Occidental Petroleum Corporation had made important natural gas discoveries right in Best's back yard! The Occidental Lathrop Gas Fields. Best used natural gas to manufacture ammonia for nitrogen. Harris paid a visit to Dr. Armand Hammer with the intention of buying natural gas. Instead, The Best Fertilizers Co. was ultimately bought by Occidental in 1963 and Dr. Bill Garman became President of Best.

During the next five years, enormous gains were made by Best. Garman created the "Maximum Yield Grower Program," an integrated fertilizer, pest and weed control system for greater yields and quality crops.

Garman instigated "test plots." Salesmen were trained to test Best products and methods against traditional farming practices, right on the farmer's land where he could see the difference. Eventually, many of these growers of California's major crops were out-producing State averages 2 to 1.

All during this period, the old Oakland plant continued to serve the mushrooming Garden & Lawn business, benefiting from Best's agricultural research and success.

Finally, in 1968, "Occidental Chemical Company" was formed in Houston. An eastern division was established. The old "Best Fertilizers" company name was dropped, and the western division became known as OxyChem.

Today, with 500 times the production of the 1930's, and over \$100 million in sales in the West, "OXY" is the trademark for all agricultural products of OxyChem-West. But, after 45 years, the good old name of "Best" continues to brand the 200 lawn and garden products sold through 3,000 retail stores to homeowners in eight western states. And Jim Lindley heads up the entire division, an organization that has never lost money in its entire history.

BEST...it still has a good ring to it. ■

At left, a Best office worker and lab technicians; below, some of our Best salesmen in 1959 with delivery truck.



HOOKER

The INVISIBLE Friend

By Stephen Hammer

The great Caliph of Baghdad liked to mingle with his people in disguise, quietly spreading wealth and happiness.

The Hooker tradition of three centuries of bettering man's lot has some of the same unrevealed Arabian Nights quality. The name is hardly a household word; yet, every household in America bears its mark—from the water in the tap to the liberties we celebrated in our Bicentennial Year.

The products of Hooker Chemicals & Plastics Corp. (HCPC), like so many cuckoo's eggs, are in virtually every human nest. Like the old Caliphs, they travel incognito, in guises of clothing, shelter, autos, toothpaste, soap, medicine, paper, telephones, mothballs, cosmetics and a thousand other commonplace essentials—even the money in your pocket.

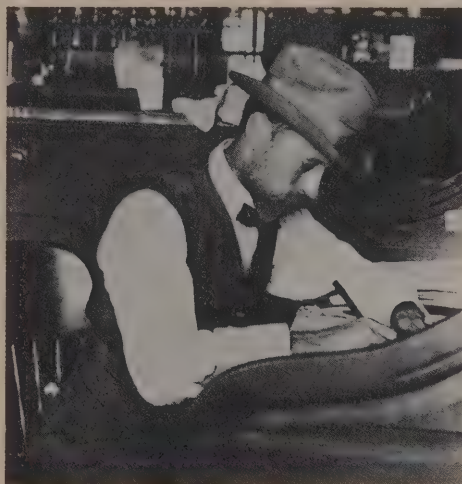
The company traces its ancestry to Thomas Hooker, an English preacher whose sermons for freedom drove him from home in 1633 and earned him historic reputé as "the father of American democracy." He helped found Hartford, Connecticut. His progeny include six Colonial governors and the first mayor of New York.

In today's history books, these men rate little more than footnotes, and the family carried on thereafter in honorable obscurity for three centuries. "Fighting Joe" Hooker, one of Lincoln's famed but less successful generals, was no relation; the Hookers who helped govern New England and later win America's independence from the chemical cartels of Europe were a different clan.

Theodore Roosevelt, close friend of the company's founder, was president when Elon Huntington Hooker, great-great-great-great-great-grandson of Thomas, discovered the seeds of fortune in chemistry in 1903. He found an untried invention in search of capital, a process to turn salt brine inexpensively into chlorine and caustic soda. Elon had capital—mostly other people's—in search of profitable investment. Fusion of these assets created an enterprise which today turns out industrial chemicals and plastics worth almost



Above, Elon Huntington Hooker, founder of Hooker Chemical Corporation, 1907; below, the three-room farmhouse which served as Hooker's first office building; A.H. Hooker; the first Hooker laboratory was housed in the second story of this dilapidated old barn in Niagara.



three-quarters of a billion dollars a year with more than thirty plants in eleven countries and 11,000 employees. A spinoff enterprise brings the total to nearly a billion.

The invention on which the company was built is the Townsend Cell, named for its creator, Clinton F. Townsend. Loosely speaking, it works in the reverse of an electric battery. The latter releases electricity through spontaneous chemical reaction. In HCPC's chlor-alkali electrolytic cell, an electric charge sets off a chemical reaction in an inert compound, salt water, separating its components—chlorine, caustic soda and hydrogen.

Although much refined, this process remains the basis for much of HCPC's modern output. It is a technology leader in the chlor-alkali cell field and royalties from licenses on HCPC cell technology annually produce millions of dollars of revenue for the company to this day.

This illustrates the soundness of Elon Hooker's judgment when he committed all the financial resources of his Development and Funding Company to the Townsend process. The firm was meant to back a variety of ventures. But the success of the chemical project left no room for others.

Townsend was a chemist and patent attorney who, in later years, added other research laurels in industrial chemistry. Working with him on the cell was Elmer A. Sperry, an electrical engineer whose gyroscope later became indispensable in sea, air and space travel. At HCPC, they were joined by Leo H. Baekeland, already a millionaire from his invention of Velox photographic paper; later he would pioneer the first practical plastic, Bakelite,[®] for years the premier name in its field of hard plastics.

The expert opinion on which Elon Hooker based his decision to bet his all on the Townsend Cell came from his older brother Albert, then a research chemist in Chicago. Albert did not sign on full-time until 1909; but he was a consultant from the start, from initial evaluation of the process through pilot plant testing to production.

Albert—his mother called him Bert, the rest of the world "A. H."—was the thinker of the clan, and probably the most personable of the brothers. His beard gave him a strong resemblance to George V, and he was sometimes mistaken for the English King during his travels.

Research was his hobby as well as his profession. He was an archeologist noted for his digs on historic Indian sites. He liked to putter with electricity, photography and other technical pursuits after a long day in the chemical lab.

His testing methods sometimes were more pragmatic than scientific. During World War I, he determined the effectiveness of a new explosive by a body count of goats he scattered in a field before setting off a charge. But he could also be orthodox—his discoveries of new applications of chlorine are credited with breaking new ground in public sanitation and water treatment. His book on the subject, published in 1909, became a standard text and was translated into numerous languages. A. H. died in 1936.

The three other brothers became HCPC executives. H. Willard joined Elon's enterprise at the start. Harry M., who became president in 1938, came aboard in 1910 to supervise construction. Paul, the youngest, was the last to sign up.



The Hooker brothers, 1920. Left to right: Willard, Elon, A.H., Harry and Paul.

The company has had three names over the years (see box). In this chronicle, it will be referred to as "HCPC" throughout.

For an industrial giant, HCPC had an unusually long infancy. At age 30, its sales totaled only \$4 million. Twenty years later it approached \$100 million, entirely through internal growth. Today the components of that company—some of them now in other parts of the Oxy organization—have sales exceeding a billion dollars a year.

After proving the feasibility of the Townsend Cell in a pilot operation in Brooklyn in 1905, the founders chose Niagara Falls, New York, as the permanent plant site for its proximity to the three essentials of the process—salt, water and electricity. There are virtually inexhaustible salt deposits within 50 miles, and the falls provided abundant, cheap hydroelectric power. Water from the Great Lakes was at the doorstep.

The first plant went into production January 9, 1906, with daily capacity of five tons of caustic soda and eleven tons of bleaching powder. The latter was slaked lime saturated by chlorine gas, the former the residue of the evaporated

alkaline fluid from the cells. The third product, pure hydrogen, was considered useless and therefore released into the atmosphere.

Caustic was used mainly in soap and as a bleach in paper and textiles as well as in the home. Applications for chlorine bleach were entirely industrial.

Working conditions in those first years were primitive by today's standards. Workers draped yards of wet flannel over their faces and wore improvised goggles to keep the worst of the irritating, vile-smelling fumes out of their systems. Many decided, after a short try, that it wasn't worth 15 cents an hour to work there. But it is a measure of HCPC's success in overcoming these conditions that some of the earliest employees stayed on to retire after 30

or more years on the job.

Early growth was rapid. By 1910, capacity was four times that of the original plant. The company was just emerging from its embryonic stages of hand-to-mouth existence when it was visited by the perennial enemy of chemical manufacturer, fire. On May 27, 1910, the wooden plant burned virtually to the ground. Damage was estimated at \$210,000.

The business had proven its soundness beyond question, so speedy reconstruction was a foregone conclusion. No employee willing to work lost a day's wages—the salvage task kept them busy. The new plant, bigger and more fire-resistant than the old, cost \$350,000. Of this, insurance provided \$180,000; the rest came from investors



An early Hooker plant in Niagara Falls, New York, where caustic soda and bleaching powder were produced. Below, Hooker made the front page of the *Niagara Falls Gazette* in 1910 when the company's plant burned down.

THE ONLY NEWSPAPER IN NIAGARA FALLS HAVING A FULL LEASED WIRE TELEGRAPHIC SERVICE.

NIAGARA FALLS GAZETTE

Vol. XVIII.—No. 62. EIGHT PAGES. NIAGARA FALLS, N. Y., FRIDAY, MAY 27, 1910. EIGHT PAGES. PRICE ONE CENT.

\$300,000 FIRE AT UP-RIVER FACTORY

Award in the Menzer Case Must be Paid!

Read was awarded yesterday by the Supreme Court of the State of New York, an award of \$10,000 to the plaintiff, Menzer, against the defendant, Read. The award was made in favor of the plaintiff, Menzer, who had brought suit against Read for the recovery of damages for the loss of a valuable piece of property. The award was made in favor of the plaintiff, Menzer, who had brought suit against Read for the recovery of damages for the loss of a valuable piece of property.

PLANT OF HOOKER ELECTROCHEMICAL COMPANY WHICH WAS DESTROYED BY FIRE LAST NIGHT.

Hooker ElectroChemical Plant Burns

Firesman Beck Went Down with Falling Wall but Escaped Serious Injury—Several Firemen Overcome by Chlorine Gas.

REBUILDING ALREADY BEGUN

Loss to plant and machinery \$300,000. BUILDINGS DESTROYED. New Cell House in which fire started. Old Cell House. Old Bleach House. BUILDINGS PARTIALLY DESTROYED. New Bleach House. Repair Shop. Fire brine tanks. BUILDINGS NOT DAMAGED.

COUNTY C. E. UNION MEETING IN CITY

Jameson and Niagara Falls Schools to Decide Which Shall Hold Rush Race Cup for Year.

FINAL DEBATE HERE ON JUNE 13

The Extensive Works of The Concern Covered Recently Wrought Is Estimated at \$200,000—The Plant Is to be Rebuilt Immediately.

COUNTRY FOR MILES AROUND TO BE PLANT

whose confidence remained undiminished. Five months after the fire, HCPC was back in production.

The insurance settlement was speeded by the meticulous records kept by Edwin R. Bartlett, a third generation Dartmouth man who joined as a time-keeper in 1907. He was assistant treasurer when he presented his records to the fire insurance adjustors who were impressed enough to pay off within a week after the last fireman had left.

Next to the fire, the most serious crisis in the company's annals came in 1914 with large-scale malfunctioning of a battery of newly redesigned electrolytic cells. Clarence M. Marsh, the chief engineer, had modified the Townsend cell for increased efficiency. The company spent \$250,000 in installing the new Marsh Cells, only to find that serious bugs remained in the design.

With typical decisiveness, Elon Hooker pushed through a complete write-off of the defective equipment, and investment of another \$515,000 to restore production reliability.

Ironically, Marsh's concept ultimately proved sound—it had merely been rushed prematurely into operation. It became the basis for the Hooker Type S Cell, a design so durable that, with periodic updating, it remains a mainstay of the electrochemical industry to this day.

With World War I, business was steady, profitable and unspectacular. Thanks largely to A. H. Hooker, then works manager and head of research, there were eight HCPC products on the market. Liquefaction of chlorine had been achieved, broadening demand into the water and waste treatment fields.

Until then, America had relied on Germany for almost all sophisticated chemicals for products such as dyes, aromatics and pharmaceutical items. HCPC was among the first to join the effort for American independence in the field of industrial chemistry.

In 1915, HCPC built the nation's first plant to extract, from coal tar, substances vital in the production of essential war materials.

Foreman of this plant was a young Norwegian engineer, Bjarne Klaussen, a new immigrant when he was hired off the streets of Niagara Falls in 1916. He was not long in proving his loyalty to his new country. He unmasked one Dr. Gustav Reich as a German spy on the payroll who passed on secrets pilfered from A. H.'s desk to the Vaterland. This, incidentally, was the closet thing to scandal in HCPC history.

Klaussen, now an octogenarian in New Hampshire, attracted HCPC atten-

tion on and off the job. While proving his professional worth to A. H. and others, Mrs. A. H.—of Norwegian ancestry—welcomed the young bachelor in her home. There he found his bride, daughter of A. H. and sister of R. W. ("Woos") Hooker, ultimately a vice president of the firm. By then, however, he had shown that he had the talent to succeed even without marrying the boss's daughter. He retired as president in 1957.

Still another future chief executive to come aboard during that war was R. Lindley Murray, a chemical engineer. Unlike Klaussen, the jobless immigrant, Murray was a card-carrying social lion from California. Elon Hooker, a tennis buff, spotted him for his skill on the courts of Long Island. He was national singles champion in 1917 and 1918, demolishing Bill Tilden in three straight sets in the second year's finals.

Murray's rise through the technical ranks was rapid and, after a stint as chief of research, he reached the top of the Hooker hierarchy.

He and Elon were the movers in making HCPC one of the first industries to bring tennis to the plant. They put courts into the shadow of the chemical works after World War I, and tennis became a popular lunchtime and after-work pastime for employees.

The '20's and '30's were static years in terms of sales and profits. Between the mid-1920's recession and the Great Depression, there was little opportunity for growth. But HCPC, unlike most small companies in America, remained sturdily solvent in the dark days.

Unlike many other industrial employers, HCPC sailed through these lean periods without unrest among its workers. One reason was management's tradition of respect for the work force.

There was a deliberate egalitarianism—everybody in the plants punched a time clock, from boss to messenger. When things were tight, there were no layoffs, although it was sometimes necessary to spread the work by short work weeks. A plant union was organized years before the Wagner Act, and continues to this day as an independent union. Labor-management cooperation generally kept the peace—there were no strikes until the 1960's, and those were of short duration.

Company protocol, never too strict anyway, was bent to accommodate the needs of hard times. During the depression, an employee with farm connections at times could get a good deal on chickens. These were delivered live—one or two dozen at a time—and management winked at the clucks and crows from hidden corners in the office.

Similar informality at times even invaded chemical research. A man once demanded, and got, total privacy for a project to increase the effectiveness of bleaching powder. His results were excellent—the addition of a touch of urea added by natural means did the trick. Synthetic duplication of the process followed, and a better Hooker product was born.

During the early years, management was headquartered in New York City although production was in Niagara Falls. The first factory outside New York State was built in Tacoma, Washington, in 1929 to supply chlorine and caustic products to the pulp and paper industry of the Pacific Northwest as well as fertilizer.

The Tacoma plant was one of the outgrowths of diversification which followed World War I. Another was the useful application of hydrogen—until then a waste product of the Townsend Cell—as an emulsifying agent, turning fats into shortening useful in the kitchen.

HCPC had a brief excursion into the consumer field from 1922 to 1927, marketing lye and bleach products through retailers. The venture was moderately successful; but it was abandoned because it required marketing techniques unfamiliar to the company, and HCPC has stuck mainly with making products for industrial use ever since.

When Elon Hooker died in 1938, the enterprise he founded was still small but rooted soundly to nurture rapid later growth. Under the presidency of Harry M. Hooker, Elon's younger brother, sales grew from \$4.5 million to \$20 million by 1948, all from internal strength. World War II was a factor, but only in part.

The start of that war found the company with 77 products in its catalog, almost ten times the number it took into the conflict with the Kaiser. After 35 years in New York, top management moved its headquarters to Niagara Falls in 1939. Its common stock was split ten for one in preparation for trading over the counter in 1940; listing on the New York Stock Exchange would not happen until 1947.

As in World War I, HCPC became a major defense supplier in the struggle with Hitler, with seven Army-Navy "E" awards to show for it. The company built and ran five defense plants for the government, turning out scores of chemicals useful in applications from synthetic rubber to waterproofing tents. It won special recognition for its participation and contributions to fluorine chemistry which was an important part of the Manhattan District Atomic Project.

Work on applying these discoveries to peacetime use was started in 1943 by a group led by a young chemist named John S. Coey. This forward planning enabled the company to switch gears smoothly at war's end. Earnings set a record in 1946 despite the loss of defense contracts and a national recession.

Coey's success was not unexpected. Two years after joining in 1937, he produced rich dividends during a four-year review of the efficiency, safety and reliability of Hooker production.

Among the innovations he instituted was the recovery of muriatic acid, a valuable chemical that was added to HCPC's product list.

Coey deliberately picked HCPC as an employer when he was fresh from college.

"I liked its products, it was the right size and it seemed to have growth possibilities," he says. "I felt the chemical industry was a good thing to be in, and HCPC looked like a good company in that industry."

The liking was mutual—Jack Coey now is president and chief executive officer of Hooker Chemicals & Plastics Corp.

In the decade following the war, Hooker sales grew from \$15 million to \$54 million, entirely by internal expansion. By 1955, HCPC was turning out more than 100 chemicals in three locations—Niagara Falls, Tacoma and Montague, Michigan, the last completed the year before. A fourth, in Ashtabula, Ohio, was a joint venture with Detrex Corporation in Detroit. The product line had not changed much since V-J Day, except that plastics made their first appearance in the HCPC catalog during this period.

By the mid-fifties, the spawning period of the conglomerates, merger-minded companies were beginning to make overtures to the small, unglamorous company in Niagara Falls. At the same time, chances for important further internal growth appeared limited, and there was danger that HCPC would be left in the dust of the giants of the chemical industry, recalls Arthur W. Chambers, corporate secretary. To survive, HCPC had to grow.

First item to attract HCPC was Durez Plastics & Chemicals, Inc., one of the leading producers of phenolic resins used in molding compounds and baked finishes, paints, inks, adhesives and waxes. It was a family-owned firm whose founder, Harry M. Dent, approached Hooker with a proposition to sell the business.

HCPC was ready to explore the acquisition route to expansion; its own Hetron polyester line fit neatly into the

Durez market, and the two managements, located in neighboring towns, had long been congenial.

That same year, HCPC also acquired Niagara Alkali Company, its life-long neighbor located across the street. Its products, although closely related to HCPC's own, still provided diversification of the line.

These acquisitions doubled HCPC sales. They were the first fruits of HCPC's aggressive search for diversification and growth opportunities outside its own domain. This search continued until HCPC had achieved the stature to become a senior member of the Oxy household in 1968.

In 1956, HCPC took its first step outside the United States with a plant in

orientation HCPC found in 1960.

The International Division came into being as part of a sweeping corporate reorganization oriented toward growth. A \$100 million, five-year capital improvement program was instituted that year, and a good part of the money went for plants overseas. By 1975, International accounted for \$220 million of Hooker's sales—almost one-third of the total. All but five per cent of this is produced abroad, but it still is a positive factor in America's balance of payments foreign exchange.

Udylite, now transferred out of the original HCPC complex, contributed \$260 million toward Oxy's 1975 sales total. Added to HCPC's other activities the company has brought to Oxy, the



Two of the Hooker brothers, H.W. (third from right) and A.H. (fifth from right) with Hooker employees in doorway of new cell house in Niagara shortly after current was turned on in September, 1914.

North Vancouver, Canada. It also got into the phosphorus and phosphorus derivatives business with the acquisition of Oldbury Electro-Chemical Company in Mississippi. Shea Chemical Corporation of Tennessee, another major phosphorus producer with a mining operation at Columbia, Tennessee, and three sodium tripoly-phosphate plants became a HCPC division two years later. In 1959, the company started a subsidiary in Mexico.

Thereafter, other outside facilities were added including Butler Chemical, Parker Rust Proof Company, and The Udylite Corporation. Udylite, a Detroit metal-plating outfit, turned out to be the most significant acquisition; it grew into a quarter-billion-dollar operation. But it was second in importance to the global

total exceeds a billion dollars.

Chief movers of these acquisitions were F. Leonard Bryant and Thomas F. Willers, two other Dartmouth graduates who made good at HCPC. Both rose to be chief executives, and their regimes were marked by explosive growth.

This also was the period in which HCPC management became peripatetic. Having moved from New York to Niagara Falls in 1939, it moved back in 1960 because the financial requirements of rapid expansions dictated proximity to the heart of the money market. Ten years later, headquarters was moved again, this time to Stamford, Connecticut. It returned to Niagara Falls in 1974.

1968, the year HCPC bought Udylite, was also the year the company was acquired by Occidental. It was a friendly

transaction, with the blessings of the Hooker management. For one thing, the price was right—Oxy shares valued at \$800 million, among the biggest price tags in American acquisition history.

"It was an offer we couldn't refuse—it was good for our shareholders," says Jack Coey. It also was good for the HCPC enterprise. In the eight years under the Oxy umbrella, the business almost tripled in sales. HCPC alone is likely to reach three-quarters of a billion dollars in sales this year. The metal-finishing business, which started with the Parker acquisition later transferred to another branch of Hooker Chemical, will put Elon's heritage past the billion mark.

That is 6,667 times Elon's gross of 1906, his first year in the chemical industry. This figure also approximates the appreciation of the capital the original investors put into the company.

And that is a soft-shoe act: a success unnoted by the public. Only the discerning see HCPC's universal aspects, traveling incognito in the Caliph's way. The trademark is invisible to most, but Hooker's impact is everywhere.

Wash your teeth or take a shower, and HCPC might be protecting your health, from water to toothpaste.

Build a house, and HCPC might be in it, from paint to plastic plumbing.

Plant a garden, and HCPC fertilizers and insecticides might be nurturing your crops and protecting them from bugs.

Drive a car, and your gasoline, tires and steering wheel might have elements of HCPC.

Clothe your baby and the diapers might not only be bleached by HCPC products—they might be fireproofed by them as well.

Go to the laundry, and HCPC chemicals might be in the soap, detergent and dry-cleaning compounds you use. And the clothes you clean might have been made with HCPC bleaches, dyes and synthetic fiber ingredients.

Anything you read might be on paper bleached by HCPC chemicals, printed with inks with HCPC contents.

Recover from an illness, and you might be helped along by medicines and medical appliances containing HCPC products.

HCPC will also touch your life each time you clean your windows, put on shoes, wash your face, feed your family, answer the phone, watch TV, paint your house or write a letter. It's no exaggeration to say that few Americans are ever out of reach of HCPC products, albeit in disguise.

HCPC is the Caliph brought from the Arabian Nights into the 20th Century. The Oxy connection has stimulated

effectiveness without disturbing management independence.

Coey, a 39-year HCPC veteran, is proof of the company's continuing freedom to act despite its corporate ties to Oxy. He presides over a management largely composed of pre-merger HCPC people. The parent company keeps a sharp eye on finance, he says.

HCPC innovation flows not only from its research laboratories on Grand Island, next door to Niagara Falls, but also from its everyday opportunities. For instance, the company is building a \$50 million plant which will turn the solid wastes of two counties into steam to supply its Niagara Falls facilities while helping to solve an environmental community problem.

Corporate good citizenship is a way of life for HCPC. Long before the law required it, for instance, HCPC spent tens of thousands a year to reclaim its land disturbed by phosphorus strip mining in Tennessee.

A look at HCPC is like a visit by the Caliph. You won't know he's been there.

That's how it is when Hooker comes to call. It's never seen, but it always has a presence. ■

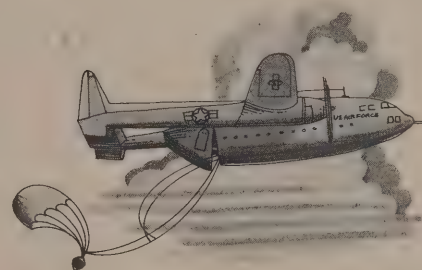
CORPORATE CHRONOLOGY

- 1903:** *The Development and Funding Company* founded by Elon H. Hooker; began caustic soda and chlorine manufacture in 1906 with investment of \$260,000, its entire capital, and first-year sales of \$150,000.
- 1909:** Hooker Electrochemical Company chartered as a D&F operating subsidiary, capitalized at \$3,750,000.
- 1916:** D&F dissolved; shareholders receive proportionate amounts of Hooker stock.
- 1940:** Public trading of Hooker stock begins.
- 1947:** Listed on New York Stock Exchange.
- 1958:** Name changed to Hooker Chemical Corporation, reflecting diversification beyond electrochemistry.
- 1968:** Occidental Petroleum Corporation acquires Hooker through exchange of stock; transaction valued at \$800 million, nearly four times shareholders' equity. One dollar invested in 1905 had grown to \$3,077, exclusive of dividends and other rights.
- 1974:** Hooker Chemical Corporation becomes the name of a new corporate entity, an Oxy subsidiary located in Houston, Texas, the parent company's chemical division. Hooker Chemicals & Plastics Corp. is the new name given to the original enterprise, which is wholly owned by Hooker Chemical Corporation.
- 1977:** Sales totaling more than \$750 million for the year, 5,000 times the gross income of 1906. ■

All that GLITTERS

By B. B. Rios

"Orbiting the globe, then returning earthward upon signal, Discoverer XIV's space capsule plummeted home to be snatched from the heavens in an historic mid-air catch... The returning space capsule was plated with Sel-Rex Bright Gold..."



The year was 1960. History had just been made, and the Sel-Rex Corporation in Nutley, New Jersey, had been a part of it. By means of the foregoing magazine ad copy Sel-Rex, a pioneer in processes and techniques for precious metal electroplating, proudly announced the role its patented bright gold process had just played in this important United States space program effort. The role of pioneer, however, was not new to Sel-Rex, discoverer of the world's first bright gold plating process.

Back in 1943, Morris M. Messing, a trailblazer in the electroplating field, decided to play an active part in the growth of the industry. He helped found the Bart-Messing Corp. (a forerunner of the Sel-Rex Corporation). Its original home was in Brooklyn, New York, and in addition to selling chemicals, the firm manufactured rectifier equipment for electroplating.

When operations were moved across the river to New Jersey, in 1951, a second venture, Sel-Rex Precious Metals, Inc., was organized by Messing. The future looked bright and with the entry into the precious metals field, growth became rapid.

Sel-Rex Bright Gold led the way to the introduction of other precious metal-plating processes using silver, rhodium and platinum. The invention of an acid gold plating process yielding hard, bright deposits was announced in 1957.

Space soon became a problem, and the firm moved its headquarters and plant to its present location in Nutley,

New Jersey. At the same time, the two companies were merged into Sel-Rex Corporation under Morris Messing's leadership. He also organized two subsidiary operations: Thermokarat Corporation, devoted to the development of advanced plating techniques, and Precious Metals Recovery Corporation, designed as a service to customers to salvage their scrap.

With the acquisition of The Meaker Company, a well-known and respected builder of automatic metal-finishing equipment, Sel-Rex became the first gold supplier to offer a complete package to its customers, including processes, equipment, refining and technical service.

During the mid-50's, Messing personally conducted and supervised a detailed survey of the precious metals-electroplating industry in Europe. After studying the market, resources and distribution channels, he was convinced that a great potential existed there. And so in 1959, European operations were started and headquartered in Geneva.

A few years later, a public offering of Sel-Rex stock was made. All domestic activities and Sel-Rex International, SA were brought into one corporation. Shortly thereafter, Sel-Rex (UK) Ltd. was established as a subsidiary to serve the growing market in Great Britain.

Sel-Rex Corporation grew steadily until there was no doubt that Messing had forged the company, in a very short span of time, from a small operation into the world's largest supplier of precious metals processes.

Joint ventures and associated companies were established in Europe and Japan and a network of distributors was formed to serve all of the Near East, the Orient, South America, Australia and Europe.

In June, 1968, Sel-Rex Corporation took another giant step and merged with Hooker Chemical Corporation which simultaneously became a part of Occidental Petroleum Corporation. (Messing became chairman of the board of Hooker Chemical Corporation in 1971 and retired two years later.)

Today, Sel-Rex holds more patents than any other company for electroplating with precious metals including platinum, silver, rhodium and palladium, as well as gold. Decorative applications include jewelry and watches, among others, but major uses include the hundreds of critical functional applications in electronics and related industries.

The pioneering spirit is alive and flourishing at Sel-Rex, and the company continues to develop and produce proprietary processes, customizing them for specific customer needs. ■

UDYLITE

They didn't miss a beat

Louis Armstrong, Sharkey Bonano, Tats Alexander. If, in 1919, someone had asked any one of these three illustrious American jazz musicians who Marvin J. Udy was, the answer probably would have been, "Marvin who?" The same question put to their many fans would, most likely, have elicited a similar response.

Udy was, after all, relatively unknown and a research chemist, not a musician. In 1919, however, he was hearing the sweet sound of success in Kokomo, Indiana. Though not acclaimed for his musical ability, the youthful chemist with an ear for musical tone had just discovered a new and better way to keep piano wire from rusting.

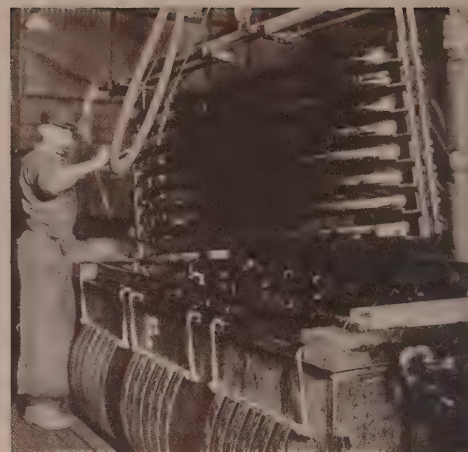
And so, in that year preceding the decade of the roaring 20's, the Udylite Process Company was formed and an entire new industry was born.

Udy found that rustproofing could be accomplished by electroplating with a metal known as cadmium. In electroplating, a metal object, such as piano wire, is immersed in a bath of metallic salts through which an electric current is passed. This causes a thin coating of protective metal to adhere to the surface of the object.

Nickel, copper, zinc, silver—these were all used in electroplating prior to Udy's discovery. None of these, however, nor any other protective coatings known at that time were suitable for piano wire because a coating sufficient to resist rust was too thick to permit the wire to produce the proper tone.

It was only after much experimenting that the determined Udy turned to cadmium. The metal's existence, known since 1817, had been little used since that time. Udy tried it on piano wire. It worked. He was delighted to find that it was not only rust resistant, but able to withstand rough physical treatment, and best of all, only a thin coating was needed.

By finding a solution to the piano wire problem, Udy had become the pioneer of a better way of plating for a great many other products. Soon numerous job shops specializing entirely in electroplating services for manufacturers were in operation.



Top and bottom; automobile bumpers are electroplated with Udylite's rust-resistant cadmium coating; center, Udylite's first Cleveland, Ohio warehouse.

The cadmium coating had a bright, silvery color that greatly increased the attractiveness and salability of the objects on which it was used, and it was found to be ideal for springs, which thicker coatings of other metals made too brittle. It also proved effective on edged tools, where rust impaired the cutting edge. Each passing day seemed to turn up new possibilities for its use.

A program of research and product development was instituted in those early days to find additional plating processes and applications. By the late 1920's, the Udylite research group had perfected a new bright nickel-plating process that not only protected metal surfaces, but imparted a gleaming sheen and luster to the metal. The process all but revolutionized product design

In 1927, when the Udylyte process had proved its dependability, another potential use was foreseen by Fred Fisher of the Fisher Body Company of Detroit, Michigan. And so, in cooperation with the Union-Carbon and Carbide Company, a decision was made to purchase the Udylyte Process Company and move it to Detroit. In its new quarters at 3220 Bellevue, the company continued its rapid growth. The tempo was fast.

The cadmium process was gaining quick acceptance by the automotive, aircraft, appliance and farm implement industries. At first, however, it required such careful application that it could only be done under the direction of a chemical engineer. Despite this and other difficulties, it was in wide demand, and

Below, the company newsletter proudly carries a story in 1929 announcing its newest customer—the United States Navy.

Through the years, significant plating processes were introduced by Udylite and product development efforts were equally concentrated on improvement of plating and processing equipment.

When the corporate name was changed to The Udylite Co. in the early 1930's, larger quarters were acquired where three laboratories were set up for research and testing. The company went into the new decade on an upbeat basis and business was expanded to include the sale of general plating supplies.

Udylite's steady growth opened the way to affiliation with other companies in the plating field, and in 1939, a new Delaware corporation was organized under the name of The Udylite Corporation. The new company acquired all of the capital stock of Bright Nickel Corporation. Some seven years later, the Parker-Wolverine Company was acquired.

During the World War II years, the corporation's energy was completely devoted to wartime production with new processes being developed as temporary substitutes for scarce nickel.

With the start of a new decade (in 1950), the Frederick B. Stevens Company was acquired, extending Udylyte's activities into the foundry field and the distribution of brick and tile. A few years later, the L. H. Butcher Company was purchased to serve western states and broaden Udylyte's product line.

By 1963, the company had moved into its new headquarters building designed by one of Detroit's leading architects. From this modern, management-research-manufacturing-distribution center, Udylite orchestrated the activities of its plants, regional offices, warehouses, testing sites and corps of technical sales engineers.

In December of 1968, The Udylite Corporation became a wholly-owned subsidiary of Hooker Chemical Corporation. Today, Udylite processes and equipment number in the thousands and include complex automatic equipment systems, some as long as a city block, used by manufacturers around the world. But Udylite is still a young company because of the freshness of ideas and vigor of the attitude among the people who comprise the organization. And the tempo remains lively. Founding father Marvin J. Udy would undoubtedly applaud the company's continuing efforts. ■

Some people can always make do with what they have. Take Clark Parker, for example. Parker needed to experiment. The kitchen stove was handy, and so he used it. Parker's experiments, however, were not of a culinary nature. They dealt with rust-proofing.

Shortly after the inception of these experiments, it is recorded, he hastily moved his equipment and his prized recipe to the basement. The reason: Mrs. Parker.

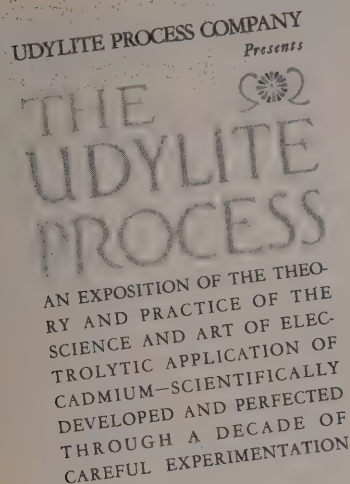
Undaunted, the soon-to-be-founder of Parker Rust Proof Company proceeded with his preliminary work to develop the process for rustproofing iron and steel by the application of phosphate coatings.

In his basement lab, in the years just prior to World War I, Parker envisioned the possibilities of this new process for industrial America which, at the time, was still applying protective coatings of paint or plating on its iron and steel products. This type of finishing, however, didn't prevent the underlying metal from rusting.

Parker had heard about an English method of coating with phosphate which resulted in a changed surface, one that was integral with the metal and also self-protecting. The result: rustproofing.

Upon bringing this idea from England, however, he found that this crude, time-consuming method would never fit into America's faster-paced industrial scene circa 1914. So, he immediately set out to perfect and speed up the process.

In 1915, the Parker Rust Proof Company was founded. In the company's



The *Udylite* News



3.3. Modern Future Vag. Name

United States Navy becomes a Udylite Customer

[illegible]

Parker's office and laboratory, 1919.

first rented quarters in Detroit, Michigan, there was a diminutive six-by-ten foot laboratory. The research equipment was described as inadequate and inefficient, and technological knowledge came the hard way. But it was a beginning.

And most important of all, the Parker Rust Proof Company had acquired two patents—the Coslett and the Richards. With these patented processes incorporated into the phosphate coating theory, the company was able to acquire 40 customers, and just two years after its founding, it moved into larger quarters with more modern equipment.

When America entered World War I, "Parkerizing," as the new process was called, found wide use in the treatment of war materials. But like many other businesses that have pioneered a new idea, the company was destined to go through some bleak years.

Attempts to introduce the rust-proofing process into industry met with very little success at the start. And during one especially lean period in 1918, bills started to pile up and officers of the company had to put up the money themselves to meet the factory payroll. However, a bond issue was floated to obtain working capital, and the tottering infant company was kept on its feet.

During the next few years, some slight progress was made, but it was necessary to repeatedly induce investors to furnish capital to enable the company to stay in business.

In 1925, Parco Powder was developed, eliminating the hazards of working with concentrated acids and reducing the time involved in preparing chemical baths for use. With the development of the powder, Parker had to acquire manufacturing facilities. Accordingly, a small factory building was purchased at Morenci, Michigan, and the first Parco Powder was mass produced.

A few years later, sales of the new product required enlargement of the plant, and a further advance was made by Parker's research staff; the Parkerizing process was reduced from more than an hour to just 30 minutes.

The year the stock market crashed, the famed Bonderite process was born. Robert Tanner, Parker chemist, discovered that the addition of small amounts of copper expedited the processing to such an extent that a commercial coating could now be obtained in just ten minutes.

This discovery was a tremendous breakthrough in the rust-proofing process as used on mass production conveyor lines, and it was immediately adopted by the automobile industry for use on fenders, hoods, splash guards and wire wheels. The refrigerator industry

began to use Parker products to some extent at this point, also.

When the Great Depression was really settling down for a stay, experimentation was intensified in the Parker laboratories, and Robert Tanner and Herman Lodeesen, working together, contributed their greatest discovery. They found that the use of certain oxidizing agents materially expedited coating action in the Bonderite process. A satisfactory coating could now be obtained in five minutes. Further improvements utilizing the same discovery led to a reduction to two minutes and later to a minute and less.

Because of these developments, the company was able to weather the depression nicely and to increase its business usefulness during those difficult years.

During World War II, Parker processes played an important part in defense. The finishing systems were quickly adapted to new materials as manufacturers made the switch from automobiles to airplanes, from trucks to tanks.

But probably the most valuable contribution to the defense effort was the ability of Parker processes to aid in the substitution of more vital metals such as zinc, cadmium, nickel, tin and chromium.

After its all-out wartime effort, Parker turned its attention once again to the auto industry which provided a major source of business for the ever-growing company. Over the years, though, the home also largely benefited from the protecting influences of Parker processes.

Refrigerators were Bonderized as were washing machines, cabinets and air-conditioning equipment. Fences and roofs were Parkerized and even radios. When people during the 40's turned their radios on to listen to Fibber McGee and Molly, the jokes may have seemed a little rusty but not the radio parts that had been Parkerized.

In 1962, when Parker merged with Hooker Chemical Corporation, a Detroit newspaper pointed out that: "A young management at Hooker and its research facilities at Niagara Falls, New York, are expected to amplify Parker's development efforts." That expectation was realized.

There are now hundreds of Parker metal treatments, each formulated for specific needs in the cleaning, treatment and finishing of metals. The company enjoys a best-in-the-field reputation around the world.

Parker's recipe for success, though, hasn't changed much over the years. It still calls for equal parts of foresight and innovation strongly laced with determination. ■

Occidental's OLDEST Company

By Tim Halford

Twenty-six years before the American Declaration of Independence, when America was still a British Colony, Leather's Chemical Company Limited, was born in a northern town in England. The company started supplying sulphur manufactured through a new process which was not only to make an important contribution to the woolen industry, but indirectly assisted the British war effort in 1776.

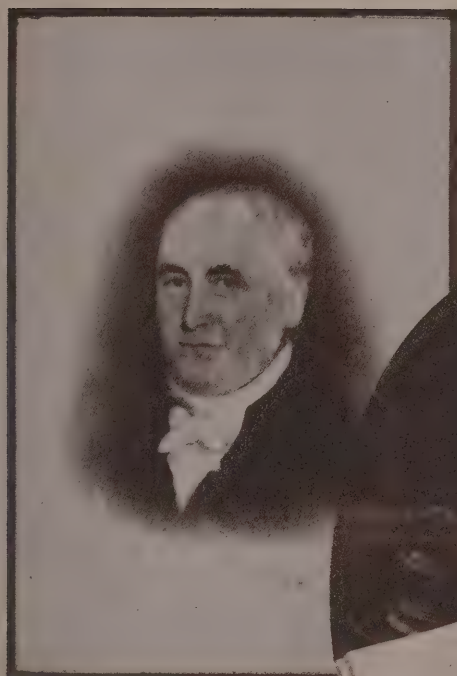
In the 18th century, Britain was undergoing considerable social and industrial change. The country was involved not only in the American War of Independence but was also at war in France, Spain, India and the West Indies. All this activity helped to create increasing demand for blankets and clothing.

Since medieval times, Yorkshire had been a center of the woolen industry in Britain, but the coming of the steam engine, with attendant mechanical advances such as John Kay's Flying Shuttle, introduced in 1750, revolutionized the industry.

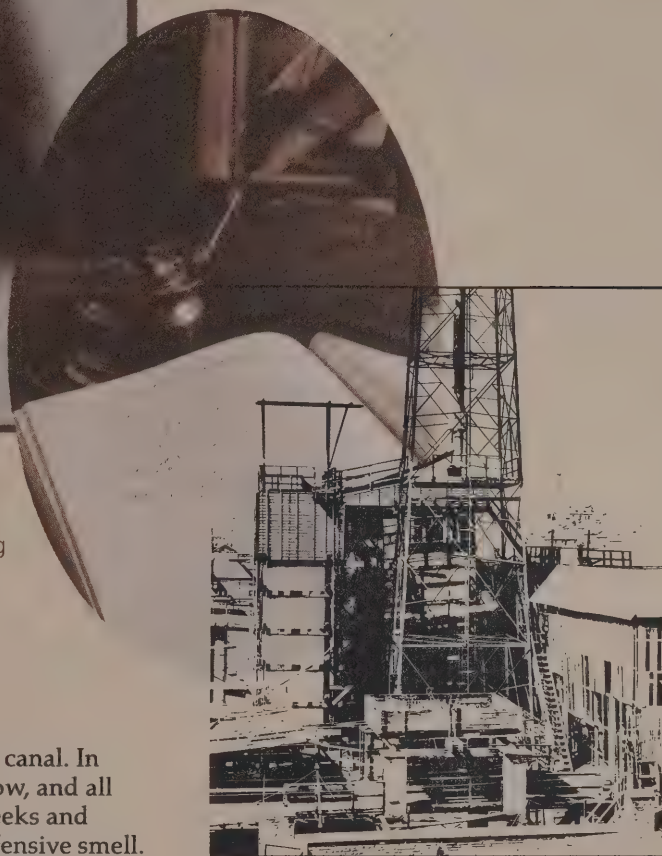
One of the problems of processing wool is to clean it to a fit state for spinning and combing. Soda and bleach are used and both products need sulphuric acid in their manufacture. In 1746, when the price per ton of sulphuric acid was £280, a process was discovered which enabled salt petre (potassium nitrate) and pure sulphur to be burned over a shallow depth of water. The fumes condensed on the water to produce sulphuric acid. This new process caused the price to decrease and, as the demand for acid rapidly increased, a new industry developed. In 1750, Charles Leather brought the new process to Bradford in Yorkshire, obtaining the supplies of raw sulphur from Sicily.

The Leather's plant was situated by the canal in Bradford, and an indication of the conditions at that time is given by the following extract from a Bradford surveyor's report in 1835:

"The drains of the town are emptied into this canal and, on both sides, there are a great many factories of various kinds of manufacture; the soil, refuse



Above, Charles Leather, founder of Leather's Chemical Company Limited; right, the company's original accounting books; far right, part of the old Leather's plant in Bradford.



and filth of which fall in the canal. In summer time, the water is low, and all this filth accumulates for weeks and months and emits a most offensive smell. The canal occasionally takes fire."

The conditions, however, did not seem to affect Leather's. One of the few descriptions we have is given in some notes in a diary kept by a Mr. John Hainsworth who is thought to have been works manager of Leather's at the time. This mainly contains a record of plant replacement, but also one or two personal notes.

"James Broadbent died 6th January, 1837 and was interred on the 10th of the month.

To each man of the works was given a frock coat.

Samuel Broadbent was attacked very violently with the typhus fever at York 19th of March, 1838 where he had gone to transact business of his own. He came home on the 28th same month, very dangerous, and was confined to bed for a long time.

20th December, 1837, a great and overwhelming flood at Bradford. About 2 o'clock, the water began to rise as it were and, all at once, the streets and cellars of houses and shops were almost simultaneously filled with water.

30th Jan. J. Kettlewell set on.

3rd Feb. S. Shackleton set on.

17th July, Young Master died of consumption and was buried.

24th July, each man of the works received a new coat and hat."

There are, unfortunately, no other records of the company remaining until the 1920's when it passed, by marriage, into the Burnett family. During the Second World War, the sulphuric acid produced by Leather's was of such value as a dehydration agent in the making of explosives that J.R. (Ronnie) Burnett was excused service in the armed forces in order to look after the business. He was a very keen cricketer and, at the age of 38, became a hero in Yorkshire when, in 1958 and 1959, as captain, he led the Yorkshire County Cricket Team to its first national championship win for a number of years.

It is probably true to say that, until 1962, there had been very little growth in the company since the early days. The production capacity was 400 tons per week from two production lines, but due to transportation difficulties, marketing of the product was limited to the Bradford area. In addition to its use in the wool trade, sulphuric acid was, by then, also used as a cleaner and stripper of metals and was vital in the manufacture of bleach and explosives. An indication of the level of sophistication of the company was that horse-drawn carts were still used for transport until the 1950's, and it is recorded that one horse called "Billy" was so lazy he

had to have a fire lit between his legs before moving in the morning.

In 1963, the business came under the control of Peter Slater and the present managing director, Alan Sutton, who purchased the majority of the existing share capital from Burnett. The business, still on the original site at Canal Road, Bradford, had one of the oldest lead chamber plants in the country. In 1964, the new management acquired a further lead chamber plant in County Durham with a capacity of 500 tons per week and started the period of expansion which continues today.

The business continued to grow and, in the late 1960's, a new type of plant was designed and built in St. Helens in Lancashire. At that time, with a capacity of 600 tons of sulphuric acid per day, it was the largest plant in the country. Occidental acquired the business in 1970 when the St. Helens plant was just complete.

A new plant has since been built at Trafford Park, Manchester, and the Bradford and County Durham plants have been closed down. A further plant is planned at Seal Sands in North East England.

Turnover and profit have continued to increase since the early 1960's, and Leather's now supplies to industry three times more sulphuric acid than any other open market supplier in the United Kingdom. When the Occidental accountants first saw Leather's books, they were amazed by the tight financial control. At close of business on Friday, the accountants would work to produce a full financial analysis of the previous week's/month's/year's trading by 9:00 a.m. on Monday—a system which would have warned many companies of impending ruin.

Leather's now employs around 185 people and not only operates two acid plants, but subsidiary and associated companies have seven other sites producing animal feed stuffs, ground sulphur and pure acids. The company's customers cover the whole range of British industry including oil refiners, manufacturers of detergents, fertilizers, explosives, chemicals, papers and foods.

This year, Leather's has acquired a company in a nearby Yorkshire town which manufactures hydrochloric acid and potassium sulphate—another move forward into a new but associated area, one that perhaps will help Leather's to progress profitably through another two-and-a-quarter centuries.

From its inception when America was still a colony to the present day, 227 years later, Leather's has been a consistently profitable company, an achievement of which Occidental is rightly proud. ■

The Bakersfield Connection

By Aileen Buholtz

"Once we started to grow there was no stopping us," is Léo Adams' comment on the life of Occidental's Exploration and Production Company in Bakersfield, California. Léo, assistant secretary to Occidental Petroleum Corporation, has been with the Bakersfield operation from the days of Gene Reid Drilling, Inc., before Occidental and Dr. Hammer came into the picture in 1959, and has watched the pages turn in the making of a real success story.

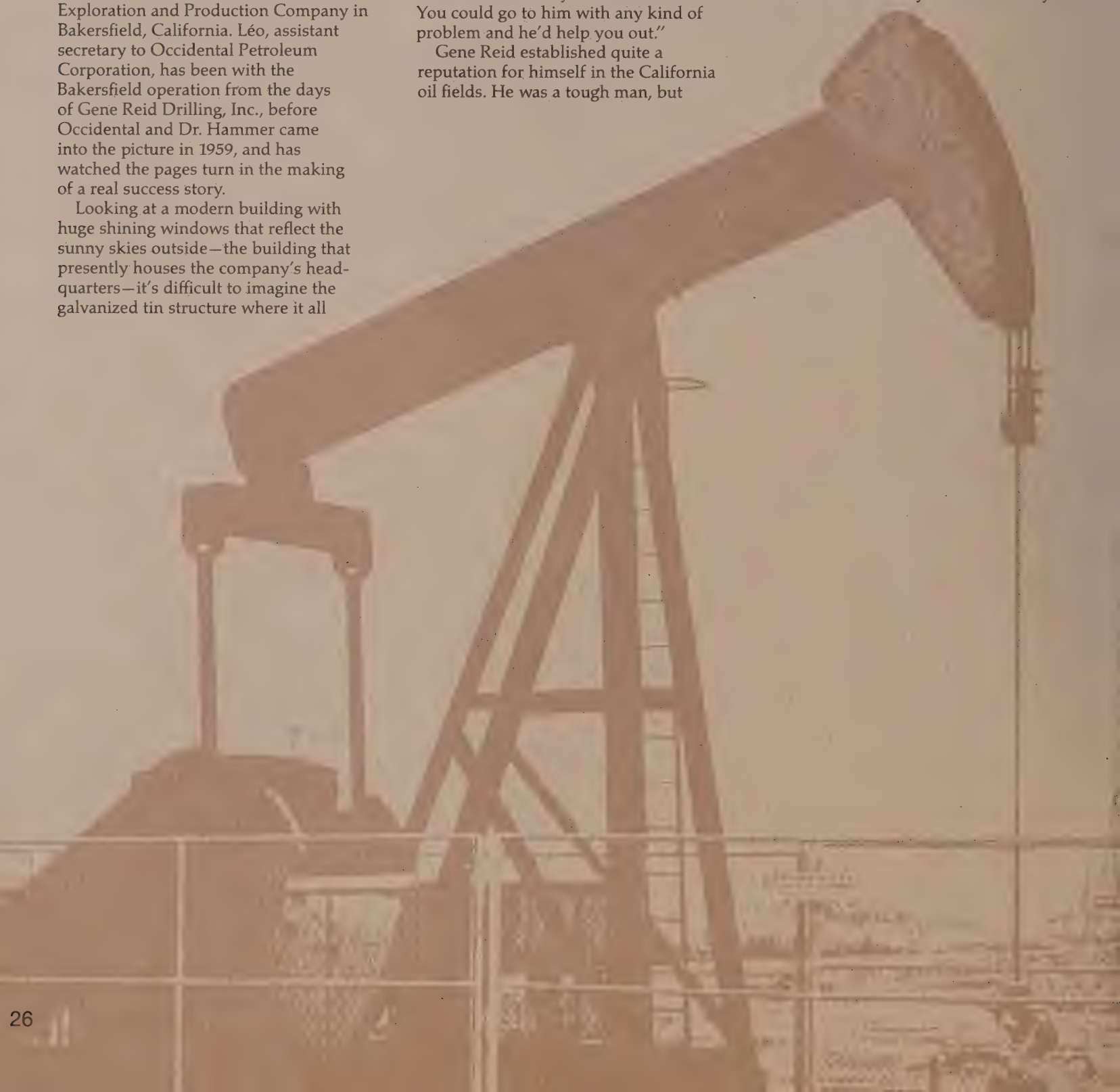
Looking at a modern building with huge shining windows that reflect the sunny skies outside—the building that presently houses the company's headquarters—it's difficult to imagine the galvanized tin structure where it all

came into being years ago when Gene Reid Drilling, Inc., met Occidental Petroleum, and things really started to happen.

That rough old shed on Pierce Road was the office of a genuine wildcatter, the late Eugene C. Reid. He was brought up in the booming California oil town of Maricopa with oil in his blood and drilling on his mind. His father was a minister, and Gene grew up a straight man, an idol to his roughnecks, and a legend in his own time. His employees loved and trusted him. Jean Peters, who was his secretary, says "They threw away the mold when they made that man. You could go to him with any kind of problem and he'd help you out."

Gene Reid established quite a reputation for himself in the California oil fields. He was a tough man, but

incredibly honest. His word and his handshake were his bonds, and he, without exception, backed them up to the letter. As Richard Vaughan, Oxy's executive vice president for worldwide exploration, remembers, "He didn't believe much in lawyers or contracts. He'd move a drilling rig in on a handshake if he knew the credibility of the other man. He was really a man of his word, and that was something he insisted become a part of the new Occidental trademark. If any of us made a deal or a promise with any other company, it didn't have to be on paper, or have to be substantiated by sixteen attorneys and



five accountants. That deal was a deal, and we lived up to it."

Even if a venture didn't work out as expected, Gene Reid always came up with whatever he had promised. Farmers and landowners would go to Gene, tired of being manipulated and sometimes cheated by certain companies, and invite him to come and drill on their land. And drill he did, with much success, saying that hard work made good luck.

Léo recalls when Gene Reid and Dr. Hammer came together in the late 50's. "They made a good combination—Dr. Hammer with his financial genius and business expertise, and Gene Reid with a reputation for square dealing and ability to handle any oil field situation, which made him welcome at any gathering of oilmen." They were two exceptional halves that combined to create a wholly successful oil company. So, in 1959, Gene Reid Drilling, Inc., was merged into Occidental Petroleum Corporation as the operating arm of the business.

At the time of the merger, Oxy boasted all of four employees in Los Angeles, and Gene Reid Drilling, Inc., in Bakersfield had less than ten. This little group included Gene's son, Bud Reid, the young geologists Richard Vaughan and Robert Critchlow, Charles Horace, a petroleum engineer, and Robert Teitsworth, presently Chairman of the Board and Chief Executive Officer of Occidental Oil and Gas Corporation. But new additions to the family soon appeared, and as the office became rather overcrowded, another location was obtained.

Dick Vaughan tells of the move in 1959 from the Pierce Road office to the present location of Occidental Exploration and Production Company at 5000 Stockdale Highway. "This was

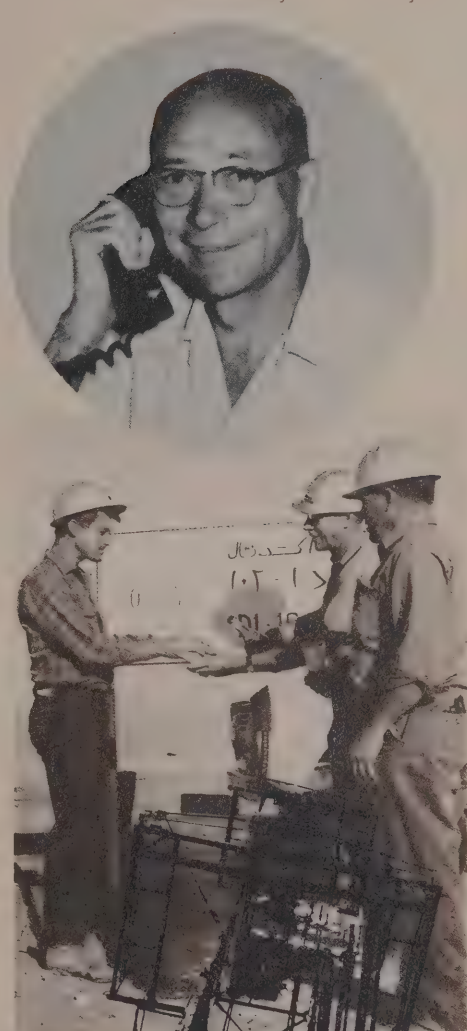
the water office of the Kern County Canal Company. We acquired these five acres, along with the office, and we weren't quite sure what we were going to do with five acres of land, but we had to take the land to get the office. It was also a working portion of the Stockdale Ranch, and they grazed cattle all around us." The cattle have since been replaced by a lovely, modern shopping center, gas stations and parking lots, and the small office and five acres have been transformed by a number of additions to accommodate the 285 people currently working there.

With a fresh outlook from its new offices, the young company turned to the Sacramento Valley, a dry gas province overlooked by the larger gas companies and inactive for many years. Dick Vaughan goes on to say that, "We negotiated a joint venture on acreage that had previously been held by another company in the Arbuckle area, and that was really the start of Occidental as we know it today. Dr. Hammer gathered 10 or 12 of his friends together and they put up the financing for our initial drilling program, and we had the great fortune to make a discovery at Arbuckle and had a whole series of stepout extension discoveries."

That was in 1959. In the following two years, there were seven or eight additional discoveries which served to bring in more investors, attract capital and allow for more drilling. The OPC balance sheet of March 31, 1960, showed the company to be completely free of debt, and Oxy was off and running.

The first major discovery for Occidental occurred in 1961—the Lathrop gas field, the second largest dry gas field in California. As Stan Eschner, Exploration Manager—North America, puts it, "The Lathrop discovery kind of took the patch off our seat.

Below, the late Eugene C. Reid; Reid and Occidental employees celebrating Occidental's first discovery of oil in Libya.



OCCIDENTAL
PETROLEUM CORP.

"It was really incumbent upon us in those early years not to fail—or else we wouldn't be here, because we didn't have any inherited inventory or reserves. We were starting from scratch. We started in a period when the oil industry was on a decline, so theoretically, we should have failed. But we were a very close-knit group of guys, pretty willing to swing on anything. If confidence is a frame of mind, if success is a frame of mind, then we had the right frame of mind. The fact that we were in the Sacramento Valley was counter-industry. We were one of very few operators there because most of the other companies had given up, thinking it wasn't a very exciting place with much potential left.

"So we went in with the idea of exploring a deeper zone than had been explored before, and we found lots of gas.

"Whenever we had a policy meeting in those days (and we had very few of them because Dr. Hammer and Gene Reid had a pretty good understanding of each other's responsibilities), Doctor never told Gene how to drill a well and Gene never told Doctor how to raise money. They each held to their respective responsibilities and did the job. But they would get together occasionally, and when they did, the whole staff would meet. In those formative years, we would go to lunch at Maison Jaussaud, a restaurant in Bakersfield, and the entire staff would sit at one table!"

flew up in his old Beech aircraft, which wasn't made to land on a short strip like the dirt one at Williams, just outside Arbuckle. Doctor's pilot, happened to mention that he didn't think he could take it down on that particular strip. (There were power lines across one end and a rice check at the other.) Doctor said, 'Oh yes you can, go ahead.' So the pilot took it down and we stopped only 15 feet in front of the rice check at the other end of the runway." Vaughan decided to take the Greyhound bus home.

The 1961 Lathrop discovery made possible, in 1962, the first payment of dividends to Oxy shareholders in 28 years. 1962 also saw a 7,500 square foot addition to the Bakersfield office, made possible as new wells were spudded and brought to production. In that year, the Oxy drillers moved out to Kettleman Hills' South Dome. They were drilling very deep wells at a cost of over \$1 million each, taking so long that the men had time to tame wild animals in the area. Little foxes showed up in the "dog house" for their dinner, and the pusher, Carter Hughes (now in the North Sea), even planted a garden during his stay. Stan Eschner recalls an eventful, if not lucky, day in the field.

"We had drilled two wells and everybody was pretty excited at the third well. We drilled down and thought we were going to be at a good spot to find gas or oil, but when we got there, we couldn't see anything. Just for completeness, we thought we would test the zone. When we opened up the test tools to conduct the test, we got an immediate strong blow of gas—so strong it created waves on the sump where we were putting the mud. We were all yelling, 'steam, steam!' It was roaring so hard, we couldn't talk!

"So we went out and felt the pipes. They were ice cold, which meant we had discovered gas, and the well had pressure on the floor—over 5,000 pounds per square inch—so high that nobody wanted to go up on the floor to check anything!

"It was a tremendous test, and we didn't have it set up to gauge it, but we had a lot of guys there with experience, and they estimated that we were producing over 40 million cubic feet of gas per day—an enormous thing! But it kept declining and declining, and by the end of the day you could put your finger on top of the pipe and stop the flow."

Oxy's first major oil discovery came in 1964 in an urban area of West Los Angeles. Los Angeles had utilized coring samples to determine the location of the oil, but the actual drilling and



Above, drilling at Lathrop; left (top), pipeline construction in Libya; (bottom) a group of Libyan workmen at Zueitina.

Occidental's early annual shareholders' meetings were held at Maison Jaussaud as well, and always concluded with the distribution of box lunches to the small but enthusiastic group of hungry participants.

The company was small, and each employee was intimately involved and interested in each well. A new discovery was toasted with champagne, and although cigars may not have been passed around, Dick Vaughan remembers that "drill stem tests or gas shows always occurred in the middle of the night. One of us would be up on the well logging it, while from a gas station or a pay phone outside a beer hall, we'd put midnight calls through telling Gene Reid or Dr. Hammer that we'd had a new discovery.

"It was a very exciting time because we had a successful record. Arbuckle, West Grimes, West Buttes, Mulligan Hill, Brentwood, Oakley and especially Lathrop—it was very much a teamwork type of thing. Right after the first discovery in Arbuckle, Doctor



production took place only after Oxy had replaced a row of run-down little shops with a modern, architecturally-designed derrick and drill site to disguise the operation on busy Pico Boulevard at Doheny Drive. The derrick, resembling a modern building, and the beautified drill site, first of its kind anywhere, was recipient of the Los Angeles Beautiful award, and even the drilling mud was pine-scented to make things pleasant for the olfactoreceptors of the local residents.

The West Los Angeles operation was followed by the Sawtelle oil field discovery in 1965. This field was tucked underneath the Santa Monica Mountains fault system, 9,000 feet down. Spudding in, the drilling first produced a number of bed pans, hypodermic needles and other hospital supplies, as the drillers realized that an old hospital garbage pit had been chosen for their drillsite. Below, the oil waited, to eventually flow at over 1,000 barrels per day.

The year 1964, however, held greater things in store for Oxy and its exploration and production crew. One day Dr. Hammer posed the question, "If we could go any place in the world to look for oil, where would you want to go?" The answer was Libya, and for the first time, Oxy left home to explore for oil overseas.

In a determined effort to succeed, application was made to bid on the concessions opening up in Libya in 1966. A three- to four-inch appendix was assembled in New York and turned in to the Libyan authorities with only half an hour to spare before the July 30, 1965, deadline. Jim Blom, Exploration Manager—Eastern Hemisphere, tells of the bid opening that took place on the following day.

"In Beida, the Brazilia-like capitol, high up in the mountains, the oil companies of the world were assembled for the opening of all the applications. Some had been flown there from Tripoli, and everyone else was arriving by taxi and aircraft from Benghazi. We flew out in our good old B-25.

"As the applications were opened, we saw the other companies had turned in little looseleaf notebooks with four or five typewritten pages of material—no pictures, no 'pizzazz'! But there, sitting on the table, were the copies of our application, each in a package the size of a couple of shoe boxes, wrapped in a ribbon in the colors of the Libyan flag.

"The tension mounted as the people were thinking 'Good grief, we might have to spend days here,' because the opening of the first few applications was

taking hours.

"There was no lunch served and no food available, so I had to duck out and try to get transportation into town to buy something from one of the stores there which might somehow be edible.

"By the afternoon it was fairly warm, and the representatives of some of the mightiest companies in the world were sitting in their chairs, perspiring and getting rather sleepy.

"Then came the moment of the opening of Occidental's application, and things became quite heated and excited. People rose from their chairs and were trying to look over each other's shoulders to see what this thing contained, as Dick Vaughan was called up and asked to explain it. Inside were all the documents needed to support Occidental's application; stamped and sealed, diagrams charts, everything bound in leather!

"Dr. Hammer's application was a tremendous success in achieving an impact in what otherwise was a very dull and stretched-out day. That impact went further and seemed to have a lasting effect, because we were later awarded blocks high in our order of preference."

The Libyan government had previously announced that cash bonuses would not be determining factors in awarding the concessions, but that they were looking for offers which would contribute to their nation's welfare in a more practical and direct way. For the small oil company from California, this was just what the Doctor ordered for an easy delivery into the world of international oil business.

Perhaps Oxy did not have the financial muscle of the major oil companies vying for the Libyan concessions, but when it came to good, practical ideas, Oxy could compete with the biggest and best and come out on top, which was precisely what took place in Libya.

In March of 1966, the concessions were awarded. Bid blocks 43 and 42-B went to Occidental. The two proposals in the Oxy application which opened the doors to the Libyan oil fields concerned the construction of an ammonia plant to utilize the natural gas which was being burned off in the oil fields at the time, and the development of an agricultural program in the Kufra area. Thus, the Libyans were being given an opportunity to increase their employment and feed themselves at the same time, an offer hard to refuse.

But Occidental was in Libya for oil, and in mid-November, discovery well D1-102 was tested at the rate of 14,860 barrels per day. A sky-high pillar of smoke and flame rose from the burning pits, and the roar and vibrations from the test shook the desert for miles,

preventing seismic testing ten miles away. Several months later, with the drilling of our first test on our other concession, we discovered the "A" reef, the test of which flowed at 44,000 barrels per day. As the desert shook and roared, Dr. Hammer flew in with the Libyan petroleum minister, Khalifa Musa. Driving from the oil-can marked runway to the drillsite, they passed an abandoned camp, left by the previous concession holders exploring in that area. Dr. Hammer pointed out to the minister that here was an example of Occidental's success where others had failed. This was the discovery of the first major reef in Libya, and a truly great accomplishment. "That was the day that changed Occidental," recalls Richard Vaughan. "We were on the road to becoming, if not a major oil company, a very significant factor in the international oil business."

In June, 1967, however, the Six Day War exploded in the Middle East, causing a rather unsettled state of affairs for everyone in the area. Jim Blom tells of a remarkable business decision made by Dr. Hammer at that time.

"The war disrupted our situation in Libya rather severely and caused the exodus of most of the Americans by airlift. The oil field at that time had only been demonstrated by one well, and the investment climate in Libya was very risky, based on current events and the shaky status of Americans in Libya. So a decision had to be made if we were to continue with the development of this oil field, which involved the construction of a 120-mile pipeline and a terminal on the Mediterranean Coast at Zueitina.

"When the political news was the blackest, the decision was made to go ahead with the development of the field. Orders were placed and purchases were made to get this discovery on stream as fast as possible and we were able to get on stream just eight months after that decision with a million barrel-per-day capacity pipeline and terminal. A fantastic record!"

From his office window, Jim gazed toward the Elk Hills anticline, one of California's largest oil fields, and mused, "This team of oil explorers and 'doers,' between Dr. Hammer and the group here in Bakersfield, has discovered over four billion barrels of crude oil, just between Libya and the North Sea, not to mention Peru, Venezuela, Bolivia and Trinidad. To think that our group has done so well in foreign countries, when only a few years ago we were just a little California oil company."

Gene Reid might well be pleased with the progress of the "little" company. But he probably wouldn't be surprised. ■

The NEXT twenty years

By Dr. Armand Hammer

Some people might think that a company that has grown as much as Occidental has in the past twenty years ought to be reasonably pleased with itself. Maybe some companies would be, but not Occidental. My own view is that, while we've done some exciting things together over the last two decades, the future holds just as much promise and maybe even more of a challenge. We don't have time to be pleased with ourselves yet.

The whole energy scene is changing today; we no longer live in the easy world of 1957, although I'm not sure things were so easy then, especially for a small struggling oil company. We certainly don't yearn for those days because the challenge is in tomorrow, and I think that Occidental is well placed to take up that challenge.

President Carter has recently told the American people what we have known for some time; that oil-based energy from conventional sources is becoming scarce. He quite rightly has stressed the need for the nation to conserve what we have and to divert energy needs to non-oil sources like coal.

I see our future in helping to develop new sources of energy and extracting the maximum benefit from those sources we use now. With our shale oil program we are already on the way, and I firmly believe that in a relatively short time we will be supplying substantial quantities of this oil to the nation's refiners. From our joint operation with Ashland Oil, Inc., in Colorado alone, we expect to be producing around 50,000 barrels a day in about six years, but that is nothing compared to the ten million barrels of oil we currently import every day.

Under the Rocky Mountains, there is a vast reservoir of shale oil. If it can be effectively tapped, then our dependence

on foreign oil will be alleviated. It can be done...we think we know how to do it. All it needs is the cooperation of government, and this nation could be quickly on its way toward energy sufficiency. I am confident that we will get there, and I find it very exciting that Occidental is leading the way.

Occidental is a leader in the development of our vast coal reserves. We have believed for some time that the nation would once again turn to this bountiful source of energy for industry and power and, over the past five years, we have been developing new mines, acquiring additional reserves and adopting new techniques for more effective mining. The day of coal is here once more, and Occidental is ready for it. What's more, our research people have been working steadily on processes to both liquify and gasify coal with gratifying progress. We may not be there yet, but I am confident that success is not too far away.

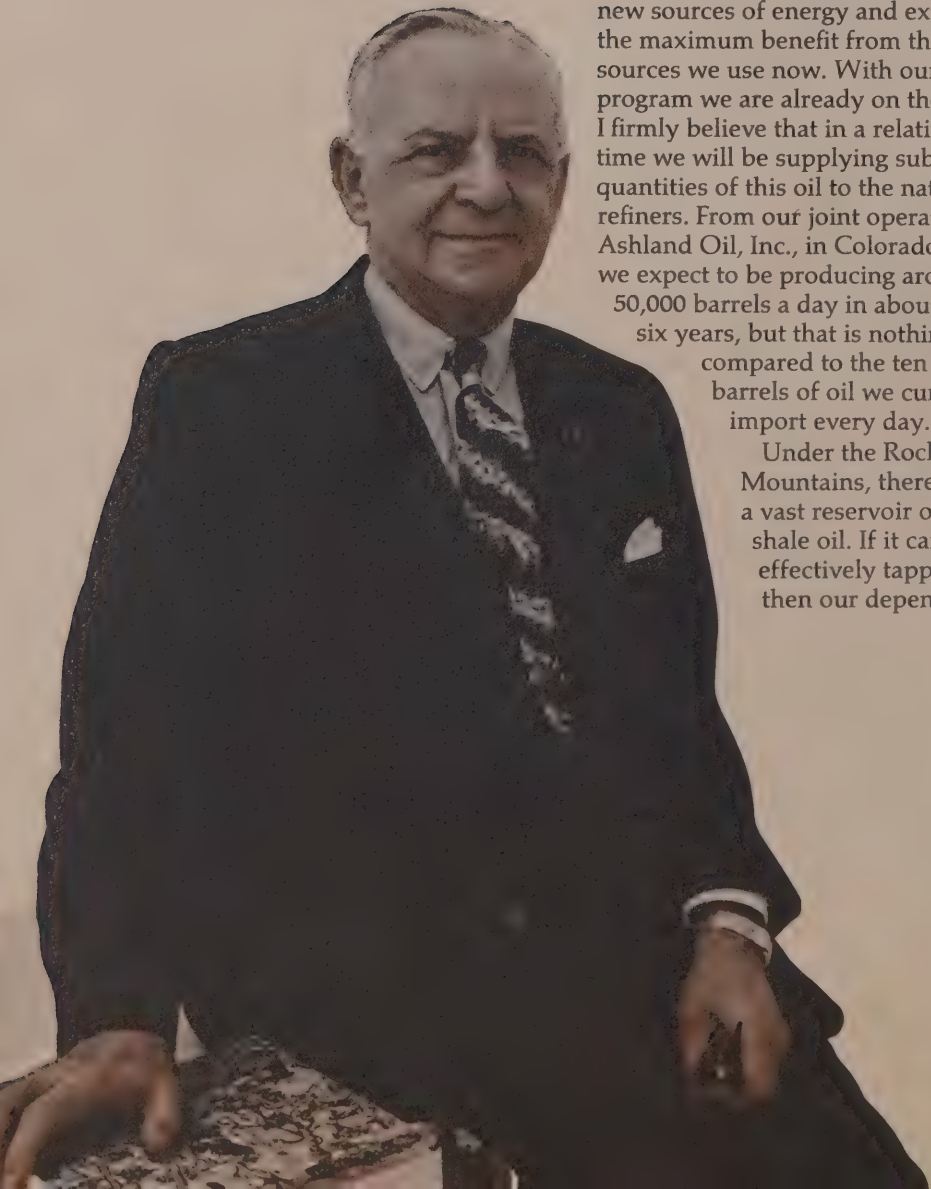
Our company is also interested in geothermal energy, and we are just beginning to get to work on this important potential for the utility industries. In a few years, Occidental could well be one of the leaders in this new field.

Yet Occidental will remain very much an oil company. We don't think all the oil has been found yet, nor do we think that all we have found has been retrieved. Some people think we've been lucky in finding oil, but I've always believed that luck comes to those who work hard, and we're still working hard at finding oil. Just recently we found a new field in Libya, another in Bolivia, another in Peru, and we have a promising gas discovery in Trinidad. We're about to start a new program in the United States, and we're prepared to back up our efforts with a billion dollar budget.

So in the next twenty years, you'll probably hear more about how "lucky" Occidental is at finding gas and oil, but we'll know why.

As I travel around the many parts of the world where Occidental is active, I am continually impressed by the kind of people we have in the company. Oxy people aren't like a lot of the people working for other large corporations, and I think that's because our people just don't believe they've got to the top of the mountain yet. And we haven't.

There is so much still to be done... such a challenging future for our company out there. I believe there is an energy revolution about to take place in this country and in the world at large. It could well be that this company of ours will lead it. ■



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**The
Remarkable Life of
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by Bob Considine



Is this any way
to run a
corporate
RESEARCH
laboratory?
YOU BET IT IS!

By Robert W. Sutton

Occidental Research Corporation, the corporate research division of Occidental Petroleum Corporation, has three objectives: to generate, identify and explore emerging new scientific concepts of importance to the natural resource and energy business...to develop technologies from these concepts...and to spearhead the commercialization of these technologies. In this issue of OXY TODAY, we meet some of the key people at Occidental Research who are putting these objectives into practice.





Coal gasification is a major project at Occidental Research Corporation.



Martin Berger, president of Occidental Research Corporation and corporate vice president for research and development.

"It is the business of the future to be dangerous." —A.N. Whitehead

If Whitehead is to be taken literally, there are people involved in some pretty dangerous business in Occidental Petroleum Corporation. They are the growing assemblage of futurists at Occidental Research Corporation, the wholly-owned subsidiary of Occidental that serves as the corporate research division.

You see, ORC has accepted the challenge of taking the point for OXY and all its divisions and to steer the course into the future. The future is unknown, and the unknown is always dangerous.

Dangerous? Unquestionably. Risky? It's always risky business to explore new frontiers. Worth the Investment? Let's examine why OXY's leaders are optimistic about the very real gains to be realized just over the horizon; gains of great consequence in terms of possible proprietary profits for OXY and significant yields for America's energy resource potential.

Many of ORC's research findings hold great promise and make headlines for their innovative combination of practical, cost-efficient solutions to problems with what were thought to be staggering technological pitfalls.

Pioneering a means for extracting the billions of barrels of oil trapped in shale beneath the snow-capped Rocky Mountains without disturbing the environment; converting our cities' ever-increasing solid waste from a useless blight to retrievable metals, minerals and a useful liquid fuel; learning new ways of mining coal that are far safer yet which increase yield by some 20-30 per cent—these are all developments ORC engineers are working to bring to commercial reality.

But it isn't all that easy to take a Buck Rogers-type notion and make it a

practical and buck-yielding reality. It takes a special, unique formula to bring it all about. In order to really understand how ideas become invention and eventually investments, it would be well worth our while to meet some of the special people at ORC who will, in all probability, play a very big role in the business of the future at Occidental.

The first place to start is at the top. And ORC has dynamic leadership in Martin Berger, president of Occidental Research (and recently elected vice president of research and development for Occidental Petroleum Corporation). As unconventional as the people and division he heads, Berger is in large measure responsible for ORC's resurgence within the corporation. He doesn't shirk this responsibility, he relishes it.

"To me, it's the opportunity to put everything I've learned in research together in an industrial research organization," says the 50-year-old former director of Exxon's government research laboratories.

"I'm really a great believer in the power of industrial research when it's done right. As far as society is concerned, the primary role of industrial research is to implement science to the service of mankind through a corporation in a profitable manner," Berger maintains.

The husky, 6'3" former Coast Guard signalman and veteran of the D-Day invasion of Normandy during World War II assumed command in April, 1976.

"I found two things," Berger relates, "some very exciting projects and some very exciting people. What was missing was a sense of direction. So the first thing I did with the laboratory was put together a written charter that speaks to the purpose of Occidental Research Corporation. I went to the board of directors of OXY and said, in effect, this is my contract with them. This is the document I want

to be judged by and I want my organization to be judged by."

Here's what the Occidental Research charter says:

"The principle objectives of Occidental Research Corporation, reflecting Occidental Petroleum Corporation stated policy, are:

- to generate, identify and explore emerging new concepts of major importance to the profitable exploitation of resources (natural or other) of current or future corporate interest, and when justified...
- to develop, in cooperation with the appropriate business unit, where applicable, a proprietary technical package that will give to Occidental a protected and superior competitive position, and...
- to spearhead the commercialization of these technologies with appropriate business units."

"We think there are tremendous technical challenges in coal, chemicals and petroleum. In many cases, the technology is stuck! What we try to do is generate new science that can unstuck the technology," Berger explains.

Berger has embarked on an ambitious program to meet the perceived needs of Occidental in the years to come.

"The way I work is to ask a particular division to help me hire the key research men—people they trust, men they recognize. I've done that three times and it's very important since our number one objective is to do work in conjunction with the other OXY divisions," Berger stresses.

Everyone at ORC is enthusiastic about Occidental's increased support of their efforts. The most notably tangible testament to that fact is the recent acquisition of new larger facilities which will house expanded, state-of-the-art laboratories and offices for ORC research

scientists and engineers.

"We know where we're going now, no question about that. We're going to have the best laboratory for energy and natural resources in the country. The company's foresight in providing this excellent facility was a necessary ingredient," Berger maintains.

Another necessary ingredient is the working environment created by management to optimize the likelihood of producing new concepts and innovations and careful selection of talented individuals to enhance the staff. Berger has some very definite ideas on who he wants and how they should be treated at ORC.

"I believe in maintaining a high degree of professionalism in the staff. I encourage them to gain professional recognition, attend meetings, publish. Personal recognition and advancement help us. They bring prestige to Occidental. It helps in recruiting the very best new talent, and it opens a reservoir of contacts and current information for our people.

"We also try to create an environment which allows people to take risks. Yet there's a tension between expensive risk taking and cost constraints. There is also a tension between the highly creative people and the analytical people that relates with real world economics. We have many skills to achieve our aims, and they are all equally important. The tension, I think, is healthy—it's creative. In my view, controlling this tension is an important aspect of research management."

As to the ultimate criterion for judging the worth of the research produced by Occidental Research scientists, Berger does not mince words:

"If our methods work, most of the major processes and products used by Occidental will ultimately bear the mark of ORC.

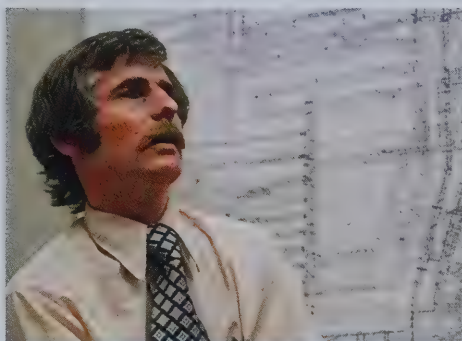
"If Island Creek's productivity rises sharply, if Hooker Chemical hits the market with a revolutionary product, or if the Oil and Gas division makes a breakthrough in providing for our energy needs, I want people to say, 'Oh yeah, that's because of a process developed by ORC...'"

Let's meet some of the high-caliber researchers who have their eyes on Occidental's business of the future.

You might catch your first glimpse of ORC's research scientist in charge of forming a new mining research division trotting along the roads and paths in the hills surrounding ORC's La Verne, California facility.

Hilmar von Schonfeldt often runs five-mile jaunts during the noon break rather than consume the high calorie lunches most of us are used to. But then, Hilmar is a very unique man.

His freckled complexion and sandy blonde hair belie his 40 years of age. Copies of *Running* magazine are piled beside technical books and papers in his spartan office. A couple of well-traveled pairs of Adidas track shoes are in one corner of the office, attesting to their owner's passion for running.



Hilmar von Schonfeldt

When asked why he chose to come to ORC in August, 1976, von Schonfeldt responded, "I like to see the results of my work. I like to see the research applied to engineering problems for short-term results, in say 5-10 years, compared to more basic, long-term research."

Hilmar was one of those specially selected by ORC's management since he is a recognized and respected expert in the coal production field. He will provide useful services for OXY's Island Creek Coal Division.

He was involved in the first trial in the United States of a "shield support" system for the "longwall" mining technique. According to von Schonfeldt, longwall mining has the potential of increasing productivity dramatically and it's safer. It has been employed for some time in England and Germany where some 95 per cent of the mines utilize the method instead of other coal-mining techniques like the "room-and-pillar" method employed in most U.S. mines.

"The room-and-pillar method gives you a checkerboard pattern" von Schonfeldt describes. "You can't control the roof as well, and you must leave up to 50 per cent or more of the coal in the ground. In longwall mining you excavate mile-long tunnels around blocks about 500 feet wide, then mine 100 per cent of the coal between the tunnels allowing the rock above to collapse behind as the crew digs in a protected, steel machine. That way, 75-80 per cent of the coal can be mined in a more stable mine."

Von Schonfeldt is ever mindful of the practical side of research. "A research organization has to be useful to the corporation, otherwise you have everybody pursuing their own interests. If it doesn't fit into the general corporate structure, I don't see how you can justify it."

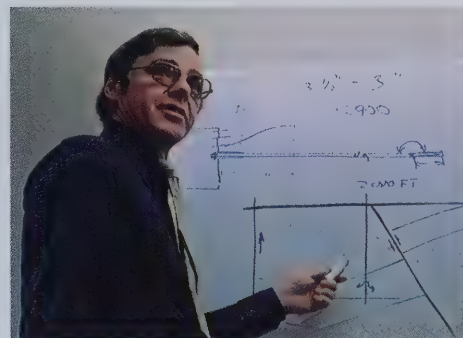
Another new face at Occidental Research is George Miller who heads up ORC's oil-and-gas production research.

Miller has years of experience as a research scientist, as a corporate manager of research and development and as a private consultant.

"We're going to begin a program to speed up the general area of enhanced oil recovery," Miller relates. "It may surprise you, but when we're all done with current technologies, we're very lucky to recover a third of all the oil we're discovered!"

"Unless some new technology comes along or the economics of recovery change, when we walk away with all the oil we can economically get, twice that amount will still be in the ground—and we don't have to go look for it! We know it's there, and when you compare the problems and costs of exploration, enhancement of recovery becomes a rather attractive venture.

"So our aim is to find the most cost-effective methods to do that and hopefully come up with some proprietary methods of doing it," Miller summarizes.



George Miller

"I happen to be optimistic. I think there are a lot more reserves in the world than the doomsayers are talking about."

As to his new job at Occidental Research, Miller candidly comments, "I think it seems pretty chaotic right now, but that's understandable, because I think we're going through a lot of growth and resetting of targets. I guess I wouldn't have come here if I hadn't been excited about what I see as the goals of the company to really expand their commitment to do research. Personally, I think it's very exciting. A challenge like that just doesn't come along very often, and I thought, 'Take a crack at it. Life's short.'"

The prototype free spirit at ORC is probably best embodied in a very talented chemical engineer, Bob Frischmuth. Frischmuth is a refugee of the NASA's Lewis Research Center, Cleveland; Shell Development Co., and

Plastonium, Inc.

His flowing beard, ready laugh and bemused attitude emanate from a lanky frame which combine to create a somewhat unorthodox impression.

"I encourage people to stir up trouble, get their nose in it, get burned once in a while," says ORC's manager of coal processes development. "The main thing is to get the job done."

"What I see that's unique about Occidental is more than a commitment to spend research dollars. It's a commitment of the corporation to go ahead and risk money to try to implement some of that research. And that's what makes me excited," Frischmuth reveals.



Bob Frischmuth

"There's a tradition at Occidental to go ahead with ventures that have a high risk and high potential gain. So I can't think of a better organization to work for from a research standpoint."

"Everybody's job here is to solve problems. If there were no problems, we wouldn't exist."

"I guess the big difference in research is that, rather than reacting to situations or problems, we create the problems first and then solve them," Frischmuth says.

Frischmuth, like most of the people at ORC, is project oriented. The organization changes fluidly to suit the needs and demands at hand.

Occidental Research is in the middle of three stages of development in Frischmuth's view. "The first phase was identifying and developing new concepts, and we've done that quite well. The next phase is to develop technology to support those concepts. The third stage is commercialization. Once we've done that, our job is finished...except it always starts over again on a new concept," he smiles, obviously pleased by the prospect of years more fun with Occidental's giant-size chemistry set.

Dr. Ann B. Tipton packs a powerful dose of creativity in a small package. A native of Freeport, Texas, the former specialist for Lockheed Propulsion Co. and instructor at the University of Texas, Tipton flashes a smile as heartwarming

as Texas chili, a specialty dish she enjoys preparing when entertaining guests.

"I've lived in California for eight years now, but I can't seem to lose the accent," she says shaking her head.

Tipton is presently engaged in formulating a mechanism to desulphurize the char produced in Occidental's coal liquefaction process. It's work she finds challenging and exciting.



Dr. Ann B. Tipton

Tipton had first-hand experience in the front ranks of the women's movement while gaining entrance to her chosen field—industrial research.

"I was, in fact, quite discriminated against in the late 60's when I was looking for my first position." Tipton feels that many non-governmental contracting corporations did not feel the pressures felt by those, for example, in the aerospace industry which is strongly dependent on government funding, and where she found her first employment.

"I've had to do a lot more consciousness elevating in the petroleum industry than in the aerospace industry," she acknowledges.

The outspoken researcher says, "I've had three different supervisors, and some have had less expectations than others of my work, and that's the first time I've encountered that. I feel like I have to do things a bit better, but it's not that big a problem. It's a matter of recognizing it and confronting it," she says assuredly.

"For the most part, I will have to say, Occidental Research is a really good place to be associated with. The company itself does have a bright future. They're doing a pretty good job of looking at 'first class-ism' from all points, and I enjoy being part of that growth," she asserts.

Dr. Frederick Leder is director of exploratory and new ventures research. He also came to ORC from Exxon after many years in its corporate research labs, where he attained the position of planning advisor.

"I try to act as a catalyst, a stimulus, a guideline when things have gotten off the rails," Leder reflects, "but I really

look to my people to present new ideas, the creative innovations, and to be the experts in their fields. I certainly don't view myself as the technical expert in each field.

"Another advantage in a corporate laboratory," Leder reminds, "is that we have the ability to interact. We have interfaces between physics and chemistry. A technique which is well known to a chemist may not be well known to a geologist until the two meet in the hall for coffee in the corporate research laboratory.



Dr. Frederick Leder

"The underlying theme is that we're looking for innovations at ORC, major steps forward which will have long proprietary life. By doing fundamental research in relevant areas, we feel we have the best opportunity to take long steps forward which would then be most easily protected and give us the most durable proprietary position.

"OXY is a very innovative company. It's an ideal place for researchers, because it's big enough to support this kind of research and small enough that the impact of the research is felt."

In reality, the business of exploring and leading the way into the future is a dangerous, risky business requiring dreamers, visionaries and pragmatic prophets.

In the words of Occidental Research's president, Martin Berger:

"By a coincidence, the problems we're working on are the problems that are the crux of the national interest. It's really an opportunity to be where it's at in technology. And that's an added kind of incentive.

"I'm glad I'm at Occidental at this particular time in history, because 20 years from now, OXY will be a very large company. Then the element of risk, some of the excitement that exists now, won't be there. A company that size is more worried about keeping what it has than to try to acquire more. I'll be retired by then," Berger says reflectively, "but I'm really glad to be with the company now when it's trying to grow." ■



Occidental Petroleum First Quarter Earnings Up 63 Per Cent

1977 first quarter net income amounted to \$33.3 million, 63 per cent more than the \$20.4 million earned during the same period in 1976.

Primary earnings per share for the 1977 first quarter were 45 cents compared to 24 cents in 1976, while fully diluted earnings per share for 1977 were 41 cents. Fully diluted earnings per share for the comparable period in 1976 are not presented as the result would have been anti-dilutive.

First quarter net sales were \$1.46 billion in 1977 compared to \$1.1 billion in 1976, up 33 per cent.

There was a decline in Hooker Chemical Division and Island Creek Coal Division earnings for the quarter, compared to 1976, due to the extreme weather conditions experienced in the eastern half of the United States during January and February, 1977. However, March showed a return to more normal operating conditions in chemicals and coal with improved profits over the prior two-month period. Throughout the quarter, Oil and Gas Division earnings were substantially higher than last year, mainly from Libya and the British North Sea.

North Sea oil liftings which began in January are expected to build up throughout the year as new wells are brought into production, and therefore Occidental's 1977 earnings should be significantly above the \$183.7 million earned in 1976.

Common Share Dividend Increased

On April 21, 1977, the board of directors declared an increase in the quarterly dividend rate on the common shares—from 25 cents per share to 31-1/4 cents per share, equivalent to an annual rate of \$1.25 per share compared to the former rate of \$1.00 per share—payable July 15, 1977, to shareholders of record on June 10, 1977.



Galvin

Berger

James J. Galvin Elected Executive Vice President of Hooker Chemical Corporation and President and Chief Executive Officer of Agricultural Products Group

James J. Galvin has been elected executive vice president of Hooker Chemical Corporation and president and chief executive officer of the Corporation's newly-formed Agricultural Products Group.

Galvin, 46, came to Hooker from W. R. Grace & Co., New York, where he was vice president and director of Grace and group executive of its Agricultural Chemicals Group since 1974.

The new Agricultural Products Group which Galvin heads consolidates Hooker's activities in the agricultural field. It comprises Occidental Chemical Company, a major producer of agricultural chemicals, fertilizers and related products; International Ore & Fertilizer Corporation, a worldwide marketer of fertilizer compounds, intermediates and raw materials, and management and coordination of the Oxy/U.S.S.R. fertilizer project.

Galvin holds a B.S. degree in business administration from Northwestern University and an M.B.A. degree from Harvard Graduate School of Business Administration.

Martin Berger Elected Vice President of Research and Development

Martin Berger, president of Occidental Research Corporation, has been elected vice president for research and development of Occidental Petroleum Corporation.

Berger replaced Donald L. Baeder, who recently was named president of Occidental's Hooker Chemical Division. Berger will also continue to serve as president of Occidental Research Corporation, the position he assumed when he joined Occidental April 2, 1976.

He came from Exxon Research and Engineering Company where he served for two decades, first as a research physicist, then as a research associate, senior research associate, laboratory director of the physical science laboratory, director of the corporate research laboratories and director of government research laboratories.

He was a research physicist with Uniroyal, Inc., 1950-1954, and Chrysler Corporation, 1954-1956.

Berger received a bachelor of science degree from Columbia University in 1949 and did his graduate work there. He was a signalman in the United States Coast Guard 1943-1946. He is married, has three children and resides in Newport Beach, California.



Loucks

Ridley

Robert A. Loucks Named Vice President and Operations Manager of Occidental Oil Shale, Inc.; Richard D. Ridley Given New Post at Oil and Gas Division

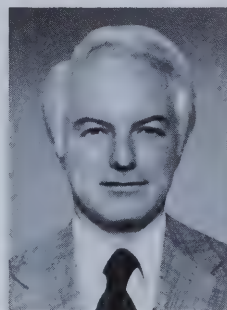
Robert A. Loucks was named vice president and operations manager of Occidental Oil Shale, Inc., last December.

Richard D. Ridley, who has served as vice president and manager of operations in Grand Junction, Colorado, and was responsible for launching the field operations for Occidental's shale oil project, moved to Occidental Petroleum Corporation's Oil and Gas Division in Bakersfield, California, where he is serving as vice president of planning and marketing.

Loucks came to Occidental from Shell Oil Company where he managed a variety of engineering and construction projects including the former Ashland Oil, Inc.—Shell Oil Company C-b shale oil project in Colorado. Shell recently suspended its interest in the project. Ashland Oil and Occidental have since agreed to undertake a joint venture on the C-b property.

Loucks received his B.S. degree in metallurgical engineering from Montana School of Mines in 1957. He joined Shell Oil immediately upon graduation.

Occidental Oil and Gas Corporation Appoints Legal Executive



Trapnell

L. David Trapnell has joined Occidental Oil & Gas Corporation as vice president and general counsel.

Trapnell, 43, was previously with Continental Oil Company where he served in various legal capacities since joining the company in 1958. He graduated from the Law School of the

University of Oklahoma in 1956 and was admitted to the Texas Bar in 1965.

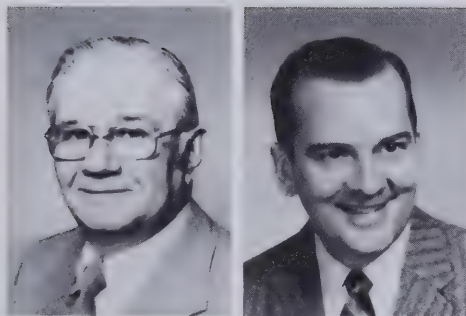
Trapnell is located at the Houston, Texas, headquarters of Occidental's worldwide oil and gas activities.

Occidental and Ecopetrol Sign Contracts for Exploration of Oil in Colombia

Two contracts for the exploration and exploitation of petroleum in the Middle Magdalena valley of Colombia were signed in Bogota on February 16, 1977, by representatives of Occidental de Colombia, Inc., a subsidiary of Occidental Petroleum, and ECOPETROL, the Colombian state oil company.

One contract covers approximately 238,098 acres in the Sogamoso area and the second covers some 425,892 acres in the San Fernando area.

Occidental has begun a seismic program in both areas. The Middle Magdalena valley has been an important oil province since the drilling of a discovery well in 1918.



Turyn

Cooper

John Turyn Named New President of Virginia Pocahontas Division of Island Creek Coal Company

John Turyn, Jr., formerly general manager of the Virginia Pocahontas Division of Island Creek Coal Company, has been promoted to president of that division. The Virginia Pocahontas Division of Island Creek is headquartered in Keen Mountain, Virginia, and is one of four operating divisions of the company.

As president of the division, Turyn will oversee the operation of six mines located in Buchanan County. Each of the mines is currently working in the Pocahontas Number 3 seam, generally regarded as one of the best coking coals in the country.

Turyn, who has over 32 years of mining experience, including 25 years with Island Creek, holds a B.S. degree in mining engineering from West Virginia University.

C.M. Cooper Promoted to Vice President-Finance of Island Creek Coal Company

C.M. Cooper, a 29-year veteran of Island Creek Coal Company, was recently promoted to the position of vice president-finance for the company. He is responsible for the corporate financial department at Island Creek's headquarters in Lexington, Kentucky.

He replaces B.E. Thornton, who retired after a 30-year career with Island Creek.

Cooper joined Island Creek in 1948 as a member of the finance department in Holden, West Virginia. He was promoted to division controller in 1964, a position he held for one year, before being named manager-financial services in 1965. He became assistant corporate controller in 1968 and corporate controller in 1970.

A native of eastern Kentucky, Cooper received his B.S. degree in commerce from the University of Kentucky in 1947. Prior to that he served for four years in the U.S. Air Force.

The Coopers reside in Lexington with their three children.

Oxychem and Royster Sign Agreements for Sale and Storage of Ammonia from the USSR

Occidental Chemical Company, headquartered in Houston, Texas, and Royster Company, Norfolk, Virginia, have entered into agreements for the sale and storage of anhydrous ammonia. The ammonia, which will become available through Occidental's 20-year trade agreements with the Soviet Union beginning in 1978, is a basic nitrogen fertilizer material.

The sales/purchase agreement is a ten-year contract (subject to price renegotiation after three years) under which Oxychem will sell Royster ammonia for its phosphate chemicals complex in central Florida. The ammonia will be shipped from Russia in 25,000 ton capacity vessels to Royster's ammonia terminal presently under construction in the Tampa Bay, Florida, area.

The storage agreement is a three-year contract, renewable at Oxychem's option for a total of seven more years, under which Oxychem will store ammonia at the Royster terminal which is scheduled for completion in late 1977. Oxychem will use this storage and handling capacity to service other customers with ammonia.

Plastic Pistons Made of Durez Phenolic Molding Compound Installed in 1977 Chrysler Passenger Cars and Light Trucks

During 1976, Oxy Today (Number Seven) reported that the Durez division of Hooker Chemical Corporation had developed a new application for a phenolic molding compound in the manufacture of disc brake pistons for some of Chrysler Corporation's 1975 automobiles.

Because of the plastic piston's outstanding performance under rigorous testing and actual use conditions over the past two years, Chrysler is installing phenolic pistons on 75 per cent of its 1977 passenger car line and all light trucks.

Durez, supplier of the phenolic molding compound from which the disc brake part is made, sees the piston as offering one of the

greatest potentials for molding phenolics in the automobile business. It is now working with other car manufacturers on the development of similar brake pistons.

The Durez phenolic molding compound is a two-stage glass and mineral-filled material designed for applications requiring good physical properties and excellent dimensional stability. The latter is particularly important in the piston application.

Phenolic molding materials are a major product line at Durez. Other non-automotive markets for these materials include the appliance, communications, electrical and closure industries.

Inventor-of-the-Year Awards Presented to Three Hooker Chemicals & Plastics Corp. Employees

On February 11, National Inventors Day, Hooker Chemicals & Plastics Corp. presented Inventor-of-the-Year Awards to three members of its corporate research and development department in recognition of their outstanding contributions to the commercialization of new and significant technology in 1976.

Recipients of this year's awards were Willard A. Fuller, process design engineer, who was honored for his contributions to Hooker's proprietary technology in the production of chlorine dioxide, a bleaching agent widely used in the pulp paper industry;

Dr. Charles G. Rader, senior research engineer, who developed a new catalyst for vapor phase hydrofluorination reactions, and Stephen Robota, program leader, who discovered and developed a new catalyst for liquid phase hydrofluorination reactions.

This is the fourth year that Hooker Chemicals & Plastics Corp. has presented such awards.

More Occidental-Sponsored National Merit Scholarships Awarded

Five more children of Oxy employees have won Occidental-sponsored National Merit Scholarships. Winners announced in April were: B. Scot Williams, the son of Roger Williams who works with Oxychem at Lathrop, California; Eric Redman, the son of Mrs. Suzette Redman who works in the Bakersfield, California, oil and gas office; Greg DesBrisay, son of Charles DesBrisay, also of the Bakersfield office; Conrad Berube, whose father works with Oxy Metal Industries in Warren, Michigan, and Robert Rasmussen, whose father Clinton also works at Warren.

Winners of merit scholarships are chosen on the basis of examination scores, academic records, leadership and significant extra-curricular achievements. The competition is completely administered by the National Merit Scholarship Corporation.

All five students will now go on to college, with financial help provided by the Occidental Petroleum Corporation Charitable Foundation.

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